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# UNITED STATES NAVAL INSTITUTE PROCEEDINGS

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THE ST. NAZAIRE MEMORIAL

UNITED STATES
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*Vol. No. 53, No. 1* JANUARY, 1927 *Whole No. 287*

# *The* Broad Aspect *of* Our Pacific Problem

*By* REAR ADMIRAL W. V. PRATT, *U. S. Navy*

INTRODUCTION. In reading Stanley Baldwin's address on "Truth and Politics" given to the students of the Edinburgh University, one is confronted with the words, "Let us take our stand on public right and a law of nations with Grotius rather than with Machiavelli." The Premier was speaking of words and their value in international relationships, but this reflection, so deep, so sound, gives cause for thought.

*The point of view.* It may appear unusual to the lay thinker, that a naval man should choose to approach his subject after this manner, but there are substantial reasons for so doing. There is a school of thought in this country confined to men and women not responsible in their acts to their government, who think it necessary only to wish a thing and enact a law, in order to have it become an established fact. Many ardent lovers of peace believe that to wish peace and world stability will bring it to pass. But the government servant who is held responsible for his acts and his words knows better. No federal officials have a keener realization of the futility of such an attitude of mind than have statesmen and naval officers. This is perhaps not always understood by those who know little of the purpose of the Navy or of how its men are trained; how close students of international affairs its leaders are; how studiously they strive to keep the peace; and how intimately statesmanship and naval power are interwoven. But those who do know the Navy, know also the contribution which the trained mind of the naval officer makes to the solution of the nation's problems, and particularly in the keeping of peace between nations.

Back of every technical and local situation which confronts us, calling for the determination of a mission and a decision, there lies the fundamental cause. Unless a perception and understanding is had of the deeper and underlying factors affecting the relationship between world states, the government servant views his own special problems from a limited and imperfect viewpoint. In time of war the keen quick analysis of the immediate problem is the matter of moment. In time of peace, if this method be the only one used, it may be fraught with danger and render the naval officer subject to the charge of militarism, from a somewhat unappreciative public, which in these quiet times gives slight heed to the problems which constantly confront federal servants. During moments of grave state danger bordering on or culminating in war, the naval man must be efficient to the last detail in the art of conducting war; before such an unfortunate crisis is reached, and while matters are still within the political and diplomatic stage, every government official should know the correct method to adopt to avoid such a crisis. This he cannot



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do unless his knowledge, experience, and particularly his appreciation of fundamental reasons, lead him to choose the best way.

For these reasons, especially as most world states are now endeavoring to adjust their political problems on democratic and constitutional lines long accepted by the Anglo-Saxon peoples as being the correct way of future world progress, it behooves the naval man in time of peace to know how best the peace may be kept, though in time of war he must be the astute technician. The functions of government, in the democratic state, are so nicely balanced, that no one department can work alone; all must cooperate to a greater degree than was deemed necessary under more autocratic forms of administration. Provided we accept this and act towards this end, we possess great strength. Unless we do, our judgments are incomplete and our decisions are the casual opinions of the moment. Our national policies of long standing are not pat expressions, though they are often quoted unthinkingly. They reflect the deep inner voice of the American people. They are our peace-time guides. Even after the crisis has been precipitated, and impulse and emotion prevail, the naval man must furnish always for the stage of his immediate acts, the background of calm, thoughtful analytical decision, arrived at in peace, else he will never be able to help limit war, moderate it or determine the direction which it should take. As the architect, he must build the house wherein his naval problems rest. The foundations should be sound, else the structure with all that it contains must fall into ruin. This is the path of duty. It is also the path of sanity. If we follow this road, not only may we help to iron out our country's difficulties, but we may be able to contribute our mite towards world progress.

*A cursory survey of past influences.* In a general review of the Pacific, nothing but a very hasty survey of influences, tendencies, and actions can be made. In brief, it may be stated, that with the exception of a few adventurous spirits, traders and explorers, who early found their way into the Orient, this part of the world remained for centuries a sealed book to our western civilization. It is true certain religious and cultural influences passed from east to west and back, and also some trade, but until nearly the middle of the nineteenth century the Orient remained in a state of practical isolation from the Occidental World. During the centuries gone before, the East as a whole including Siberia remained largely a pastoral and agricultural country with a certain amount of internal local trade. The great dominating factor, however, was not industry. It was the land itself which laid its hold upon the peoples living therein, not the manufactured products which came out of it.

This, of course, affected the civilization which we call oriental. Then, too, the prevailing religions were those which we speak of as being based upon law rather than upon personality. This, too, affected the character of the oriental civilization. So it was that when we approached these somewhat isolated peoples about the middle of the nineteenth century we came stamped with the imprints of a civilization quite different from theirs. Perhaps it was no better; probably it was no worse; certainly it was different.

In dealing with the Orient, stress has been laid often upon racial differences. One may not be too sure that the dissimilarity which we note between our two forms of civilization is due entirely to race, although undoubtedly this is a strong influence. Geography, environment, religion, form of government, attitude toward life, the character of the land lived in,—all are potent factors. When America and Europe approached the East it was first with the idea of trade. Subtly and probably unconsciously the attitude of America in this advance was different from that of any other western world state. Added to the desire to trade and to enter into friendly relationships with the Orient, America unconsciously desired to convert it. This unconscious attitude is traceable to the influence which our form of government has imprinted indelibly upon the life of every American citizen. We are a nation of missionaries, whether we think so or not. This is not said in disparagement, nor is it said in praise. The average American acts in this matter unconsciously.

Howbeit, while we went there to trade, there is no evidence that we went there to acquire colonies. The acquisition of the Philippines, which after the Spanish War made us a world power, was due to none of the reasons which first brought us to the East. Our acquisition of the Philippines

was in reality a matter of fate rather than a matter of desire on our part. The same tendencies which actuated us in the approach to the East could scarcely have been those of the European states. Europe had been an armed camp for many centuries. Let us say it was no one's fault, but that the evolution of our western civilization made it so. The facts, however, speak for themselves. Though in the make-up of our great federal state, tariff boundaries had disappeared, in Europe it was not so. While much of the land we acquired was bought or had fallen to us as lucky children of the earth, the nations of Europe had fought for what they held. For many generations the continental powers had pushed out into the world seeking new avenues of trade, seeking new colonies which might enrich the Old World. We were developing our own land then.

It is not that we are better, but that civilization had advanced when we became colonizers. Had we extended our borders across water in the earlier times, it is doubtful if we could show a cleaner record behind us than, as a whole, marks the colonizing effort of Great Britain. She was a pioneer and in a sense our leader, and much of the world spread of the so-called western civilization is due to her own efforts, and unaided. Nevertheless, the fact remains that when we approached the East we approached from a country which had not been an armed camp, which had not had conflicting tariff problems, whose internal trade relationships could balance outside competition; we approached from a country which had vast resources within its own geographical limits. Moreover, in time of peace, opportunity had been afforded us to build up and to stabilize our own democratic form of government which had never had to contend with balances of international political power as a part of its daily life. Therefore, our attitude toward the East was bound to be different from that of any other of the western world states.

This difference in the attitude of approach has worked a difference in our relationships with the East in the past, and it is continuing into the future. Our attitude of mind has shown itself on several occasions. For instance, in spite of China's political weakness, America has never advocated the partition of China. It has been ever the policy of our government to oppose this. In the matter of trade, while we have insisted upon equal opportunity, we have been opposed to the policy of special interest. In other words, our attitude toward the East has, in general, been what the spirit of the Declaration of Independence means, namely, *equal opportunity for all.*

*Present tendencies.* In order to attempt to discuss present tendencies, it would be necessary to analyze the relations of the great powers *vis-à-vis* each other and the Orient, and further to consider the relationships existing among the oriental peoples themselves. These matters are so thoroughly discussed in the press and in the current magazines, that it seems unnecessary to repeat the attempt here. The best one may do is to predict, and it is preferable to leave this dubious course to those who are not held responsible for what they say.

The Pacific question is, of course, America's great future problem. Other nations interested in the matter are Holland, Japan, China, France, Great Britain, Canada, Russia, New Zealand, Australia, some of the Central and South American countries and very likely India and the Straits Settlements. Some are more directly interested than others; some are vitally interested, now and always. Others, at this particular moment, apparently are not interested at all, but all are liable to have at some time or another a concern in matters pertaining to the Pacific. There are nations in or bordering upon the ocean who desire never to see the peace broken. Some have strong nationalistic leanings. Others have not become stabilized or have not yet recovered from the effects of recent revolution. There are nations apparently who believe their destinies require further territorial expansion, or who may feel that they have vested rights due to geographical position. Certain of these nations may view their problem as in part a racial one. Many seek avenues of trade in the opening up of this large section of the world. Probably all believe that we will not get very far in the solution of any problem unless a stable condition exists in the Orient.

The establishment of a stable condition in the Orient was one of the main purposes of the Washington Conference. Without world stability, nations progress but a short distance upward; nor are instability and in-

security conducive to the practical application of the principle of limitation of armaments. Speaking generally, it is fairly safe to say that any particular governmental attitude of mind which has existed in the past will not be subject to immediate radical change unless conditions become so acute as to force it. In the matter of radical changes, conservative governments are loath to take impulsive or impetuous action. In other words, they wish to see where the road leads before they advance far upon it. This is wise. Governments which do not accept this policy are poor leaders. Matters tend to get out of hand and no matter how well meaning the intentions, the result is frequently chaotic. A chaotic condition is deadly to the cause of peace. The first condition then, and one upon which depends the ultimate solution of our Pacific problem, is *the establishment of conditions of stability and of national security to the peoples most vitally interested in the solution of the Pacific problem.*

Insofar as America is concerned, it must appeal to all thinking people that in broad matters of policy we are following consistently the general line of conduct mapped out for ourselves when first we became vitally interested in the Pacific. You have but to read of the efforts which are being made by our State Department for the solution of some of China's difficulties, and you must agree that America's attitude in the matter is as liberal and broad as the situation permits. If you need any further evidence, you have only to read the daily papers to see what America's attitude has been in the matter of revenues, questions of extra territoriality, *et cetera.* This indicates a line of conduct entirely consistent with the ideals of the American people, with the character of our government and with the traditionally liberal attitude which we have, for the most part, maintained in the past. With reason it may be said that despite certain inconsistencies, *in Far Eastern matters American policy is less in a state of flux than that of any other interested nation.* This statement is not to be taken in any sense as a criticism, nor does it lay down a course of conduct for any other nation whose necessities may be different from ours. It does, however, appear that a general survey of the situation would indicate the facts to be as stated. If it be true then that American policy seems even in the present disturbed times to have a certain continuing air of stability about it, this alone is bound to have a determining influence upon Pacific problems.

*Some salient factors affecting American policy vis-à-vis the Orient.* An attempt will be made to enumerate some of the factors which are thought to have a determining influence upon America's attitude on Far Eastern questions. These are not all of the factors. Each nation has its own particular interests, and consequently other factors enter into its view of the situation. But as regards this country, the liberty is taken of enumerating, in the order of importance, those factors which it is thought most immediately concern us.

Geography, in its relation to security, comes first. There can be no doubt that the influence of America will always be felt in the settlement of Far Eastern problems. However, to an extent which applies to no other interested country or dominion except Canada, geography, as affecting national security, regulates America's political attitude toward the Orient. It is axiomatic that no nation is quite free to act in a disinterested manner, if the question of national security may not be dismissed immediately from the mind. If you doubt this statement, ponder over the lessons deducible from the experiences Europe has passed through in the last few centuries. *Once reduce the question of national security to definable terms so that each state may feel itself reasonably secure from the encroachment of aggressors, and you have produced an attitude of mind similar to ours.* This may help to explain why America is so pleased with the results of Locarno. It is the matter of national security which helps give the factor geography the great weight it holds in international affairs.

Next in importance is placed government. The form of the American government is unique. It is both a republic and a democracy: but it is not a republic in the sense that Rome was a republic; nor a democracy like Russia. Ours is a government designed to invest law with supreme powers. No favored class has, or can have in our peculiar form of government, vested rights which conflict with the rights of other interested parties. Neither are we an unlimited democracy. While the free will of

the people always may be expressed, yet the form of government is such that the balances and safeguards are present, tending to prevent a free people from losing their sense of proportion to an extent that anarchy instead of freedom reigns. Nor have we ever admitted the divine right of kings. *Our government is a constitutional government, a government by law, but never having passed through the feudal and monarchial stages, we give to the law of the federal state, the Constitution, a divine character which it is believed no other world state does.* It has greater force in regulating the affairs of state than has any other national document. One has only to study the Constitution and to note its workings, to see that we hold this instrument of government as having a character, an inspiration and a force, which imparts to it something unique in history. *So long as we remain true to the principles laid down in our Constitution, we have a very suitable and effective instrument guiding us, which is bound to influence our motives and to determine our administrative and legislative action in matters concerning the Pacific as well as elsewhere.*

The third factor consists of our four avowed policies: isolation from political entanglements outside of our own realm; the Monroe Doctrine; the "Open Door" or the policy of equal opportunity; regulation of immigration. They are so well established in the minds of the American people, and seem to be so sane, that they are bound to influence our future attitude and actions. Though all may not agree, it is believed that America in Far Eastern matters has been less influenced by local expediency and has run truer to form in maintaining certain principles which she believes to be correct, than any other interested nation. This is not said with any air of finality or of criticism, but the more we study the matter, the more we are inclined to believe America's general policies are not only reasonably correct, but that they have an air of finality about them which is consistent with our actions in the past and will influence our attitude of mind and actions in the future. In the enforcement of our national policies we have a very remarkable instrument, the Constitution, to guide us in our aspirations and acts.

Fourth is the Philippine question—a factor which brings us intimately into touch with other island and Asiatic peoples. The ultimate solution of this problem will mutually react on us and on the oriental races. Every man and woman who reads can form his or her opinion in regard to the matter. There is a principle at stake in the evolution of independent states. *Freedom entails great responsibility, and once accepted it imposes grave duties upon peoples who desire freedom.* There is a corollary to this principle. *"In granting freedom it is easier to divest a controlling state of its legal responsibilities than of its moral responsibilities."* An onward march of events demands the recognition of those principles. International law recognizes no state which is not able ultimately to maintain itself with dignity and in consonance with usages and practices deemed essential for the preservation of law and order. Dignity and sovereignty must exist in the independent world state regardless of what its form of government may be.

Fifth, we have a highly important factor in the Hawaiian Islands. These islands lying midway in the Pacific, between the two civilizations, the occidental and the oriental, are today passing through a world phase. Here you meet a blending of the two civilizations to an extent which obtains perhaps in no other part of the world. Here you see that preconceived notions give way to actualities. In the Hawaiian Islands you see children of pure oriental extraction, whose forbears have for one or two generations lived there, smile as do our own American boys and girls. They have a light in their eyes which is in no wise different from the expression you see in the faces of our own, born here in America. What is the reason? Can it be that the spirit which had been carried to these islands by the first American settlers, a spirit coming straight out from New England, still lives in the Hawaiian Islands?

Last, limitation of armament is mentioned as an influence helping us to reach better understandings in our Pacific problem. It is mentioned last because it is a more technical matter, subject to change, and more passing in its permanent influence than any of the other factors enumerated above. Locally applied, it is a strong medicine. It may effect a temporary cure. Armament is not, however, the source of all evils. It follows that its limitation can not be a per-

manent cure. Neither should limitation of armament be confused with disarmament. This is a different thing. *Disarmament is a medicine not to be applied until the attitude of mind of all nations is such that the law will prevail without the power to enforce it. Until the law reigns supreme, as a moral force, we may not do away with reasonable national security, any more than we may do away with our local security; we may not do away with our national force, any more than we may do away with our local (police) force.*

*Will there ever be war in the Pacific?* In the present state of world development, unsettled conditions, national aspirations, state morality, universal education and perhaps the individual attitude towards duty, responsibility, religion, law and order, make war in the Pacific area by no means impossible. In the Far East there are influences at work which at any time might precipitate such a catastrophe. The world condition is dangerous though not as acute as it was in continental Europe in 1914. At present the greater powers are war weary, and a determined attempt is being made by them to avoid war. The memory of the experience of war and its frightful costs is undoubtedly the strongest force to prevent war that exists on the Continent and in America today. As such it is of inestimable value. But we must not fail to take into account that just as the intensest war hatreds fade and change their direction, so too does the memory of war horrors and costs fade. Nor is there any doubt that the new generations will not feel as intensely as we do about the utter waste and frightfulness of war, simply because they have not themselves had the experience of war and what it means. Moreover, this war weariness, strong as it is in Europe now, is not so evident in the Far East. There is a spirit of unrest in the Orient, and amongst kindred races, which expresses itself in local disturbance. From a world point of view these may be placed in the minor category now. They have not assumed the character of major importance which marked the unsettled relations between European states prior to the World War, because the Far East is neither industrially mobilized nor nationally coherent. So far as may be seen, Russia is the only power which might welcome a world conflagration,—this because her state system stands alone and, in the openly admitted convictions of her leaders, cannot continue to exist unless other nations adopt a form of government similar to her own. Moreover, the present Russian form of government is antagonistic not only to the systems of the European states and to America, but is hostile to true democracy and to the older civilization of the oriental races. At the present day, due to the sum of all influences, all peoples, save one, regardless of race, color, religion, and state systems, have this interest in common, that if war come, they wish it to be limited to minor proportions and not to assume the character of a world conflagration. All have something to lose, whether it be cultural systems, state forms of government, religions, creeds, industrial systems, or established systems of law. Therefore as a fundamental principle, *it is not only a moral duty but it is to the interest of all peoples that war should be limited in character and duration and not be allowed to spread to the size of a world war.*

Even the neutral, who profits from the limited war, should recognize this, for a state of affairs may arise to sweep away all his previous gains at the expense of others. Two questions each nation must ask itself: *"What must the state do, consonant with right and dignity, to keep out of war?"* and *"What should the state do to prevent or to limit the character and duration of war or to ameliorate and moderate the conduct of war?"* The second question applies to all states, before war, and to the neutral and to the belligerent after war has been declared, for each has interests at stake in the question of world stability. A third question which intimately concerns us is *"Will America ever be in such a war?"* Granted that a certain answer to this third question is impossible, it remains that if all federal servants, the press and responsible people, bear in mind the first question, "What must the state do, consonant with right and dignity, to keep out of war" the answer will be simplified. There is, however, the presumption permissible at present under the conditions now existing in the Pacific, that *if we are drawn into a Pacific war as one of the original belligerents it will be due to blundering.* There is reason for this statement. It is true there are certain questions which might be a source of fric-

tion between us and other states, such as trade, territorial expansion, and racial matters, but these it should be possible to keep within the realm of arbitration and diplomacy. On the other hand, America has never been involved in a Pacific war, and this of itself is one of the best reasons why we might hope to keep out of war, and expect to be able to arbitrate our troubles before they reach such a pass that arbitration is impossible. In the main we represent a civilization whose progress has been advanced through the industrial arts, face to face with one developed by people whose major pursuits are agricultural. The two civilizations complement each other and should be able to avoid undue friction. Each has need of the other, and this need extends far into the realm of industry and trade.

There is also the factor "attitude of mind" which plays such an important rôle. We are not a warlike or an aggressive people. Neither is the Orient, in the main. Perhaps we fail to appreciate how blessed we are in our ability to feel secure from aggression. Undoubtedly it has contributed much to give us our present attitude of mind. Nevertheless it has had the effect of making us less tolerant of the attitude of other nations not naturally so fortunate as we in the matter of national security. Through our geographical position, inclinations, policies and traditions, "We are permitted and desire a large degree of aloofness in political matters, though we have to a high degree a benevolent and definite business interest in the Pacific, and we should cultivate an intelligent and charitable understanding of the needs of others." To sum up *"There does not seem to be any problem arising in the Pacific now, which could not, if properly handled, be settled through diplomacy and arbitration."* On the practical side, diplomacy and arbitration carry small weight unless a nation is prepared to enforce these non-aggressive views, by more than mere words. The military and naval forces of a country take their aggressive or non-aggressive character from the political complexion and moral attitude of the state possessing them.

*Competing armaments acquired for aggressive purposes are harmful.* America mistrusts those nations possessing such armaments whose motives she deems not so altruistic as her own. In the present state of world affairs America is justified in a reasonable degree of preparation consonant with her wealth, importance, and weight in world affairs. This degree of preparation is represented in naval strength by the terms of the 5-5-3 treaty, a principle which is sane and non-aggressive and should remain the law of our land until world conditions change. We see no prospect of war now, and it must be our aim to avoid it, but should we become involved, we have behind us the resources of one of the most powerful nations of the world. Then the united will of the nation must be determined to carry on until the fulfillment of America's purpose is accomplished.

*"What can the state do to prevent or to limit the character and duration of war or to ameliorate and moderate the conduct of war?"* This very involved problem comprehends three major problems. To start with, there are certain agreements which countries universally may accept as binding, with penalties attached if the agreements be broken. A very fertile field for labor lies in the determination of what characterizes an act of aggression, together with what should constitute the penalty. A second field of work exists in thoroughly going over the question of the rights and liabilities of neutrals. Closely allied to this is the matter of "Belligerent Rights." A thorough investigation of these fields of endeavor would comprise nearly all the international law of war, and in addition would augment the present law by such contributions as were made and universally accepted under the head aggression. Speaking rather bluntly, the last war proved that any attempt to make the neutral point of view prevail over that of the belligerent, when affairs had reached the state of a world crisis, was in effect a selfish point of view, though back of this view lay tradition, past practice, legal sanction, and national policy. These exaggerated conceptions of the rights of neutrals did not help to put out the conflagration of war except through the commission of acts bordering closely upon the realm of unneutral service. Under these circumstances is it not better to declare openly for one side or the other or completely withdraw? Within limits, it is not better for the neutral as a neutral to act as

indicated, since he profits from a limited war. It is better, however, from the point of view of world stability that he give up such profits since the whole world pays for them in the resultant prolongation of the war. The preëminence of the neutral point of view will only hold in limited wars. It does not fit in with world wars. Any such doctrine as *"freedom of the seas" does nothing to shorten or to limit war.* Under conditions when all or most of the world is at peace, and war is limited, it serves well; but under any other conditions, it merely adds fuel to the flames.

Out of the chaos resulting from the last war there was born the knowledge that the international law of the past was unfitted to cope with the situations arising out of a world conflict. Even more important was the comprehension that steps must be taken (a) to prevent wars and (b) to limit war, if attempts to prevent them fail. It is towards (a), the prevention of war, that most efforts since 1918 have been directed. In the approach to this subject there are, broadly speaking, the two points of view: (1) the late belligerent or Continental, and (2) the late neutral or American. The point of view of the first class (late belligerent) naturally inclines to a determination of causes, and a solution along lines indicated through security pacts, agreements, and penalties for aggression. The American point of view inclines more to the application of the direct method—toward a limitation of armament. This latter is the safe and cautious method of approach, eminently suited to the needs of our country, though perhaps not entirely appropriate to the needs of Continental Europe. There is in all probability a happy meeting ground where satisfactory adjustment can be made.

To be in any way successful, the revision of laws and agreements on subjects indicated above should be undertaken and accomplished before another great war breaks out. The board that faces the task of revising the law should be free from political affiliations. Along the lines indicated above, there is great latent possibility of producing results which would tend to shorten the war or even to prevent it. However, to an extent that does not seem possible now, national mistrust must be laid.

The last part of the question, viz.: "How ameliorate and moderate the conduct of war" has two phases, one of which concerns any "board of review on international law," working in peace; the second phase is the war phase. In this particular line of endeavor, the four questions which contain the possibilities of greatest contribution toward improved methods are: (a) the submarine, (b) the air forces, (c) the use of gas, (d) armed merchant ships. When rules governing the above are definitely accepted, it still remains for the belligerents to agree to two things, and this agreement should be made prior to war, or at the time of its declaration. Afterwards will be too late. *First, belligerents might agree to continue limited arbitration into the realm of war. Second, they might promise to live up to the established rules of international law.*

Considering the merits of submarines and aircraft, with reference to the laws of war, there is no justice in demanding the abolition of one weapon which happens to work to the disadvantage of one nation, and permitting the unlimited use of another weapon which favors a different state. The only safe and sane way is to have one law which covers all types of warcraft. Nor in time of war is it safe or wise to have neutral rights prevail over belligerent rights in prescribed war areas. Such procedure tends to prolong the war and leads to the evasion of the belligerent's right, as, for example, by the arming of neutral merchant ships, which itself might be termed an act of aggression or of unneutrality inasmuch as the arming is against one type of warcraft only. The reply, however, is not ruthlessness, but the promulgation of law beforehand and the establishment of sufficient penalties to make failure to adhere to it during war, by *both* belligerents, exceedingly unlikely.

We cannot hope to ameliorate the character of war and introduce better methods if on the one hand we attempt to proscribe one type of warcraft, the submarine, and permit to the air forces the very methods we condemned in the submarine, for this will smack of injustice to the aggrieved nation. From the smart of injustice to reprisal and retaliation is a short road. Previous to 1914 the general practice of belligerents is outlined in this quotation taken from Oppenheim on international law:

> It must be emphasized that war nowadays is a contention of states *through their armed forces.* Those private subjects of the belligerents who

do not directly or indirectly belong to the armed forces do not take part in the armed contention; they do not attack and defend, and no attack is therefore made upon them. This fact is the result of an evolution of practices which were totally different in former times. During antiquity and the greater part of the Middle Ages war was a contention between the whole of the populations of the belligerent states. In time of war every subject of one belligerent, whether an armed and fighting individual or not, whether man or woman, adult or infant, could be killed and enslaved by the other belligerent at will. But gradually a milder and more discriminative practice grew up, and nowadays the life and liberty of such private subjects of belligerents as do not directly or indirectly belong to their armed forces are safe, as is also, with certain exceptions, their private property.

This enunciation of principles must be followed if we hope to limit the conduct of war within bounds. This is not the practice nor the intent of the modern air doctrine of the independent air force. The latter advocates a ruthlessness not surpassed by the submarine in its worst days. Nothing would be gained by heading in the direction pointed out by these advocates. Temporary gains would be followed by inordinate losses. Through the large scale destruction of property, including whole cities, as advocated by the airforce and chemical units, much of the world's recuperative power would be lost and the net result would be a return to desolation and barbarism. *Better lose a war than gain a victory on those terms.*

In the matter of the use of noxious gas, probably no country in the world could be as deadly an adversary as America, yet why should we advocate its use except under most circumscribed conditions? The power of reprisal in our hands is so deadly a weapon, that few opponents would care to invoke it. It is a safe rule to limit the use of any weapon or agency of war to bounds of objective, time and space, within which its target is a legitimate war target, and may never be other than a legitimate war target. The other method is to proscribe its use, and this attempt may not suit the views of all states. However, one of the two views must prevail if we hope to avoid a return to barbarism.

In the matter of the armed merchant ship much can be done to improve existing conditions. It was the arming of merchant ships which was really one of the bones of contention in the submarine controversy. Why a neutral should arm, unless it be for the purpose of enforcing neutral preëminence within the realm of belligerent right, is not clear, since to do this is to sacrifice strict neutrality. War is made in two ways, first through the action of armed forces against each other, and second by pressure applied against the national resources of a state contained within the borders of that state or in the process of transit to that state. The first method of war, direct action, is waged against both personnel and material; the second, pressure, is waged against state material, or that which may be converted into state material, not against personnel. A law defining the character of a public and private belligerent ship, in relation to the guns it carried, would be an immediate step in the direction of settling many questions which are now in the controversial stage, and which often lead to reprisal. If we would hope to make progress along the lines of ameliorating the conduct of war, as a first step *we must return to and abide by the enunciation of principles as laid down in the rules of international law. Second, we must make one rule of conduct applicable to all types, surface, subsurface, and air. Third, we must scan closely the question of neutral and belligerent rights and probably revise entirely our previous ideas on the subject. Fourth, we must see that these rules are lived up to under pain of penalties which it is practicable to apply.*

Insofar as the above matters concern America, as a Pacific problem of the future, we have a very fair field before us. Not having the background of previous wars to stultify our efforts, we might in time of peace be able to come to detailed agreements with certain of the Pacific powers, which would go far towards stabilizing many of the questions of international law now in the controversial stage. At least before we ever plunge into war, we should have such a document prepared embodying America's point of view. If those matters additional to accepted international law took the form of a fair and just statement of principles and proper conduct, we might get it accepted. Even if it were not accepted by the other belligerent, but clearly outlined America's proposed conduct, it would be a daring opponent indeed that would adopt a course of conduct which was considered inhumane, as our power of retaliation is too

great to reckon with in a casual manner. The matter which would require our own most careful attention is that as a point of honor, we live up most conscientiously to our own rules.

*Arbitration, the World Court, and the League.* Volumes have been written concerning the matters which are now spoken of, but is not a simple analysis all that is required if we wish to determine what is the best course of action for America to take in relation to the Orient? There can be no doubt but that in the solution of many of the world's problems there is a distinct need for a permanent court of international justice in some form. It also seems probable that whatever form the League may take, it will never replace entirely the need for special courts of arbitration. In this connection it may be noted that even though the League made the award of Mosul to Great Britain under certain stated terms, yet the press reported that Great Britain proposed to arbitrate the matter with Turkey directly. Perhaps, also, it should be noted that had the League acted in consonance with the full powers with which it is accredited, it might not have been necessary to arbitrate. However, this power was not used, though it lay dormant within the League and could have been called into existence at the behest of the council. There can be no question that as an organization suited to European needs, the League has accomplished much and should accomplish more. Of the future problems which may confront America, the greatest will lie probably in the Pacific. What most interests us is whether the present League of Nations is better able to accomplish the task of solving them than America is herself. Will the League solution of Pacific and Oriental problems be a better and more equitable solution, when the rights of all are considered, than America's solution?

The answer to this question we must work out for ourselves. The framework of our government, through the law of the federal state, the Constitution, is composed of three distinct bodies. The internal balances to our federal government consist of the states which have equal rights towards each other, and of the two political parties. We have thus a wise balance, productive of constructive results and not of discord. In our administration of government under the Constitution, the restraints to the executive power lie in the legislative and judicial bodies, who have no executive power, but who do constitute a balance and check upon the executive power. This is readily seen in the power of impeachment, in the right to confirm appointments, in the treaty making powers, and in certain articles regulating military power. In other words, it is impossible to impose over the equal sovereign states, which comprise the United States, a federal executive power which may not be recalled either through the process of the vote or through the action of the legislative body in case of the assumption of absolute powers on the part of the executive body of the federal government.

An analysis of the government of the League discloses the fact that limits and restrictions, similar to those imposed by our Constitution upon the executive power, are absent, and that in the League there is constituted a super-state with practically autocratic powers, if it chooses to use them. *In its present form the League does not conform to our form of government, in spirit at least.* The Covenant of the League of Nations forms Part I of the Treaty of Peace with Germany, known as the Treaty of Versailles. Let us now quote a passage from the *American Journal of International Law*, July, 1925, page 507, which appears to be relevant, as well as fundamental. If we accept those statements of principle, they are bound to influence America's attitude towards international relationships, if by becoming a party to treaties we violate the spirit of the Constitution.

**The principle that treaties are not the treaties of governments, but are entered into "between nation and nation," is of vital importance. No less vital is the principle that the government, in the making of treaties, is trustee for the nation in this, as in every other exercise of power. In the words of the Federalist, "As between sovereign and sovereign, the treaty power is a trust power." It follows that the Constitution purposed a stability and integrity of treaty obligations which has suffered an almost complete eclipse, if contemporaneous opinion is examined. Innovation by treaty upon principles of public law, established by the reason and usage of nations and embodied in the Constitution, is precluded under the authority of the United States, and would not be in pursuance of delegated powers nor consonant with the trust of government. New principles founded neither in justice, nor usage, nor the acknowledgment of nations, are not to be interpolated into the law of nations so as to bind**

the United States, or work material prejudice to characteristic features of its fundamental law or to its free institutions. Principles established by the Constitution and by the general law of nations may not be shaken by treaty of the United States, by legislative compact nor by executive agreement. A treaty in derogation of these principles, though negotiated by the President and ratified by the Senate, would not have been made conformable to the Constitution. This is the exception, never to be forgotten, as to the doctrine that treaties have the effect of abrogating all pre-existing federal law in conflict with them, whether unwritten, a law of nations, of admiralty, or of the common law, or written as in the case of federal statutory enactment.

Would it have been right for America to accept the Covenant of the League of Nations, a matter of such vital world importance, coupled to a treaty, in a manner more casual than the way in which she accepted the principles embodied in the Eighteenth Amendment? But aside from any legal or political complexities, would it be well for America to envisage her oriental problems from the viewpoint of the League? Would it be well for her to see her continental American problems from this angle? Finally, in the course of a generation or more, when some of the fog and the interest in the immediate European problems resulting from the late war have cleared away and abated, would it then be better to approach our oriental problems from the angle of the League or from the viewpoint of America? This is worth thinking about. For the method of approach is of necessity different, not only on account of past influences, but because *the League maintains in its organization external balances of power, with fewer internal corrective balances than the American form of government has deemed wise and essential to the practical administration of true democracy.* The American principle on the other hand does attempt to separate itself from external balances of power, and does insist upon adequate internal balances in the administration of the federal state. Might we not, by deviating from past policy, lose that which may be the most potent influence America exerts in the Orient? Thoughtful men who oppose the League in its present form are not all enemies of peace. Nor, are they undesirous of having our country make every unselfish contribution which it should to world progress. But we are not true citizens of America if we do not do our own thinking, for it is the law and spirit of the land.

*What is the most potent influence America exerts?* If you look toward Continental Europe, it might be easy to say that our wealth, our resources, trade, industry, and political power are our most potent influences there. These are much stronger than any moral influence we have in Europe. We are wanted in Europe for practical reasons but we could give nothing of lasting benefit to Europe by mixing in her political problems. The sanctity of international obligations, of which the most obvious is foreign debt, is a principle not lightly to be thrown aside. No nation is morally sound who repudiates her obligations; and in our foreign intercourse, moral obligations must be weighed with visible obligations. It will take time for Europe and ourselves to come to a better mutual understanding. Nevertheless, in time, such understanding will come.

Looking toward the west, facing a different civilization what has been said above does not apply. In the Orient the most powerful influence America exerts is a *moral influence.* Military power and national wealth make no appeal to agricultural peoples. To the force of example, the sense of fair play, and to the educational movement, America owes her greatest influence in the Far East. In the past these have carried us far. Despite certain aggravating questions, the effect of these influences has been to give us an envied position in the Orient. Will our influence there continue? If we would have it so, then we must *be Americans first; put our own house in order; abide by the principles of our Constitution; continue the work of enlightenment; do unto others as we would that they should do unto us.* If Americans remember this creed, there seems no reason why the influence of our country in the Pacific may not be as great in the future as it has been in the past. If we do not follow this creed, then, regardless of our prosperity and our wealth and resource, our utterances will be in vain. We will not be respected; we may be feared; certainly those influences resting on a moral foundation will be lost. But never need we fear isolation in the Orient if we live up to our creed.

*To Conclude.* To dig down to fundamental underlying influences and principles has been the purpose of this paper. The student who views the Pacific problem from the aspects which

it exhibits today may not be in entire sympathy with this discussion. There are at the present time many visible and conflicting cross currents running through the foreground of our Far Eastern picture. Each of these conflicting elements is the result of some phase of the occidental form of civilization, whose great advance has been due to commercialism, industry and competition coming in contact with the older oriental form. How far have western methods penetrated the warp and woof of the eastern fabric? Not very deep. Is it well that they should? Are we satisfied that there is nothing better to offer, than to carry on along the lines marked out by the history of past effort in the Western World? If so, then we must see our Pacific problem from this point of view. But let us face frankly the fact that we are bringing into a new field alien tendencies, aims and actions. In that case we have no reason to expect that the history of this effort will show greater world stability than Europe has shown in the past where temporary peace has led a tenuous life through balances of political power. There is, however, a very deep life, thousands of years old, which is purely oriental. It is not progressive; it is not enlightened, viewed from western standards; it is not competitive; it is not contentious as is our occidental life. On the other hand, it is calm, thoughtful, industrious, and in its true essence, i. e., apart from the western veneer, it is peace loving. It is the true Orient which America must envisage. We stand between the two conflicting civilizations. We have much to give the East. We have also much to learn.

BRONZE STATUE PRESENTED THROUGH FRENCH AMBASSADOR FROM THE CITY OF GRASSE TO THE SECRETARY OF THE NAVY FOR THE U.S.S. "SEATTLE," OCTOBER 11, 1919

The inscription on the statue: "The City de Grasse to the ship *Seattle*, the first American warship to arrive in France after the beginning of the war. As a token of gratitude for the aid brought by the United States in the struggle for Right and Liberty and for the homage which Admiral Gleaves, Commander of the American Squadron, has rendered to Admiral de Grasse."

# Dedication *of the* St. Nazaire Memorial

*By* Rear Admiral (Retired) Albert Gleaves, *U. S. Navy*

THE first troops of the American Expeditionary Force were landed at St. Nazaire-sur-Loire, by a naval squadron on June 26, 1917. The landing was referred to editorially at the time by M. Lavedin, the editor of *L'Illustration,* as "the most solemn event in the present and future history of our two countries."

After the war the St. Nazaire Association composed of men and women in the Army, Navy, and civil forces of the United States, who were at any time stationed at St. Nazaire or any part of Base Section No. 1, was organized, for the purpose of maintaining and perpetuating the friendships and associations formed during the World War.

In 1923 the president of the association, Brigadier General S. D. Rockenbach, the first and practically only commander of the base, from June, 1917, to July, 1919 (except for a short period when he commanded the U. S. Tank Corps in the Argonne), was approached by a number of prominent artists and other patriotic citizens of New York, who suggested that the association lend itself to securing the erection of a proper memorial to commemorate the landing of the first American troops on French soil.

The matter was referred to the President of the United States for his views and approval. He replied: "It is peculiarly fitting that such a memorial should be erected, and your association is unquestionably the proper sponsoring organization. . . . . It is good to know that a memorial is to be erected there, for it will be not only a fitting evidence of American remembrance for those who served in the World War, but also a new and lasting token of the fine traditional friendship that has existed between the French and American Republics for so many years." Thus the scheme was launched.

Subscriptions for $100,000 were solicited and every state in the Union responded. Mrs. Harry Payne Whitney was chosen to put in concrete form the idealism which the arrival of the first American troops represented. Her selection was a happy one. Already distinguished as the sculptor of the Aztec fountain in the Pan-American building in Washington, and other notable works, in this commission she so far exceeded previous achievements that she was presented with the gold medal of the Society of Fine Arts of New York.

Appropriate diplomatic correspondence followed and the French Government entered at once into the spirit of the movement and agreed to coöperate in making the unveiling a historic and national occasion. The site selected for the monument was in front of the Jardin Publique on the rocky beach (shown on the chart as Le Grande Traict) by the boulevard President Wilson, "named for the late President," wrote the *New York Times* correspondent, "when his ideals were universally accepted almost as inspired words." The ninth anniversary of the landing was selected as the day for the dedication.

The chaste and artistic beauty of the monument is unquestioned. "Surmounting a rugged granite pedestal is a huge bronze eagle which seems to have alighted after winging its way across the Atlantic. It bears the heroic figure of an American infantryman. Into this graven image Mrs. Whitney has breathed the spirit of a crusader; into his hands she has put a crusader's sword—yet his arms are outstretched in a gesture which tells the world that the American soldier is fighting for peace."

The monument over all is forty feet high. At low water the base is entirely uncovered, as shown in the photograph, but at high tide the base is submerged to a depth of fourteen feet, and then the effect of the design is most effective and impressive.

The inscription is:

HERE LANDED JUNE 26, 1917
CONVOYED BY THE AMERICAN NAVY
THE FIRST TROOPS
OF THE
AMERICAN EXPEDITIONARY FORCES
CRUSADERS OF RIGHT AND FREEDOM
WITH THE SOLDIERS OF
FRANCE AND HER ALLIES

ERECTED BY POPULAR CONTRIBUTIONS
FROM EVERY STATE OF THE AMERICAN UNION
TO COMMEMORATE A GREAT CAUSE
AND TO HONOR
THE IMPERISHABLE IDEALS OF LIBERTY
THAT UNITE THE TWO REPUBLICS

Later a bronze tablet will be placed on the seawall at the entrance to the causeway leading to the memorial, bearing the names of the convoy commander, the ships of the Navy and the organizations of the Army which arrived in the first expedition.

The twenty-sixth day of June, 1926, was a gala day in St. Nazaire. The weather was unusually fine after two weeks of hard rains. At eight o'clock a national salute of twenty-one guns was fired from a shore battery, and soon afterwards crowds began to assemble in the streets, bright with bunting. "There was no question," wrote the correspondent above quoted, "but that the town of St. Nazaire wished to revive for the period of celebration something of the same feeling the Americans experienced during the war and immediately afterward. It may be truthfully said that there were more American flags displayed in houses and shops than have been seen in any city of France since 1919."

The street parade was made up of veterans of Yser and Dixmunde wearing their red fourragéres and constellations of decorations, a group of resident American war-veterans, sailors from the French ships, children from various schools, and widows of the war. These were followed by delegations from the Grand Army of French Veterans.

The parade was reviewed from the sidewalk by the American and French officials, at the residence of M. Butterlin, spoken of as *nôtre trés sympathetique Sous-prefét.* Assembled at the *Sous-Préfèture* were the American Ambassador, Mr. Herrick, who was to present the memorial to the French Government, and the Minister of Marine, M. Leygues, who was to make the speech of acceptance. General Gouraud, Military Governor of Paris, the popular idol of the people, accompanied by his aide, General Spire, commanding the Eleventh Corps Area, received a remarkable ovation, as did also General Pershing. Upon their appearance, in the words of *Le Phare, "une acclamation s'elève, une ovation chaleureuse et spontée."* When the procession had passed, the Ambassador and the Minister of Marine led the way to the boulevard, stopping first before the monument to the dead soldiers of St. Nazaire, where the children placed flowers beside those presented earlier in the day by General Pershing.

The official guests were escorted to the pavilion facing the memorial, between lines of French and American sailors all under arms. The bands from the fleet and shore stations played the national hymns of America and France, and daylight aerial bombs were exploded over the memorial, scattering in the air a multitude of tiny flags of the allied nations. At the same time carrier pigeons were released from the official lofts and it so happened one of them perched for a moment on the hat of the bronze soldier.

In the pavilion were the Ambassador, Mrs. Whitney and her guests, the members of the French cabinet, General Gouraud, General Pershing, Admiral Gleaves, representing the Navy Department, General Rockenbach, representing the War Department, Captain H. E. Lackey and officers from the U.S.S. *Memphis,* Captain A. P. Fairfield and officers from the destroyer division, representing Vice-Admiral Roger Welles, Commander-in-Chief in European waters, Admiral Chauvin, Commander of the Channel and North Sea Division, Captain Vallois and officers from the *Voltaire,* officers from the French destroyers and submarines, the military and civil officers and prominent citizens of St. Nazaire, the Préfet Maritime of Brest, Admiral d'Adhemar de Crousac, and Admiral Vavasseur, préfet Maritime of L'Orient, the Consular Corps, the Préfet of the Loire-Inferieur, and the *sous-préfet* of Ancenis, Chateaubriant, and Paimboeuf. There were also a number of prominent Americans who had made the voyage from America especially to be present or had motored from Paris, among the latter the American sculptor, Andrew O'Conner, under whom Mrs. Whitney studied in Paris,

and Jo Davidson, who made the bronze bust of President Wilson.

Mr. Herrick spoke in English, which was afterwards read in French by his aide, Colonel T. Bently Mott, U. S. Army. Mr. Herrick spoke with marked earnestness, and his speech is worth consideration, especially in view of recent misunderstandings and recriminations. He said in part:

We were a few years ago hailed throughout Europe as leaders in the realm of idealism, pioneers in its application to world affairs; we have lately been proclaimed as materialists whose influence in the family of nations rests upon the assumption that we are the greatest present repository of the world's material power. The thoughtless accept both assertions; the discriminating reserve their judgment. But I often ask myself, and I ask you now, can it be true that if we have acquired the one, we have thereby forfeited all claims to the other?

I think not. The essential characteristics of a vigorous nation untouched by any catastrophe do not so quickly change. If we were rash idealists in 1917, have we lost that attribute today? If rank materialists now, is it possible that a few years of praise from without and prosperity within have been able to effect this harsh reversal of our character? I find these exaggerations repulsive intellectually and harmful practically.

As a nation we have always been introspective, constantly critical of our own faults, eager to know the judgments of others. We are keenly sensitive to praise or blame, but we are far less penetrated with an invincible self-satisfaction than might appear from reading the flamboyant pronouncements of syndicated writers earning a profitable popularity with those who don't reflect.

There are people who have taken advantage of these peculiarities of our psychology to sow doubt in our own as well as in other minds regarding our intentions when we entered the war. Reversing all history and starting with the new assumption that we are forever solely animated by a careful regard for our pocketbooks, they would make it appear that not only now but ten years ago material considerations were the determining factor in the decisions we took at that time. Every American should take pains to scotch this lie. The American's capacity for willing self-sacrifice in any cause he holds dear was not suddenly born in 1917; it has been his dominant characteristic for at least two hundred years. It is as much alive in our people today as it was when we declared war, and we all know full well that during the three horrible years which preceded that date it was neither dead nor sleeping.

Very soon after the great European struggle started our people began to comprehend what was happening on this side of the water. Through the blaze of passion and the clouds of deception the everyday American soon perceived what was at stake upon the battlefields of France; he saw that human liberty and elementary justice were hanging in the balance, and from the very start he had but one fixed idea, and that was to take off his coat in his own good homely fashion and enjoy the satisfaction of striking a blow in defense of common decency. That he would also be coming to the rescue of an old and valued friend added the force of gratitude to indignation. Whether it was to his personal interest or not he little cared; whether his country would be weakened or fortified by it, he bothered not to consider; a fight was on that stirred every fine instinct inherited from his sturdy ancestors, and all his soul was in the conflict.

It is high time then that a fiction which arose through the gratitude of our Allies and became fixed by repetition be cleared from the European mind—I mean the fiction that our unwilling people had to be adroitly inflamed to self-forgetfulness and lashed into action by much repeated insult before they could be made ready to stand behind a government long since anxious to act. It is not true; and it is unfair to that American idealism of which my countrymen are sanely proud, unfair to our sturdy sense of right and wrong, a slur upon all the dead who fell in the Revolution and the Civil War as well as those of yesterday, to allow this dangerous theory to go unanswered, undenied.

It is hard enough for any country to understand a near-by neighbor; it is more difficult still for Europeans to comprehend far-off America. We have at various times encountered their cold indifference, suffered from their lack of esteem, appreciated their enthusiasm, been happy in their praise, refused to resent their abuse. We acknowledge many of the mistakes which they lay at our door, but we have a right to inquire whether they were made with the desire to injure or humiliate other nations; we acknowledge that our faults may be numerous, but I find that as yet no one has suffered from them but ourselves.

Americans now ask only that those who wish to judge us, if they cannot come and study us at home, at least take the trouble to search the history of our international conduct in the last hundred and fifty years. If during all that time they find we have been selfish, mean or grasping, a bad neighbor or a lukewarm friend; if we have cringed before the strong or ravished the weak, then confidence in our purposes is misplaced and the faith we demand in our intentions must be refused; then indeed the American soldiers who landed at St. Nazaire, at Lorient and Bordeaux had better have stayed at home, and the host which stood ready to follow were wasting their time in wishing to meddle in the family quarrels of another continent.

I do not believe that the verdict of history will be rendered in this sense; I do not believe this verdict will find that our attitude toward other countries since our entry into the family of nations has been marked by humility when we were weak or by arrogance when we were strong. We look all other peoples today squarely and frankly in the face, proud of an unblemished record of fair dealing with all nations in the past, and calmly determined to continue this course in the future. We say to them, as Byron said to Tom Moore:

"Here's a tear for those that love me,
And a smile for those that hate,
And whatever sky's above me
Here's a heart for any fate."

M. Leygues, in his eloquent speech of acceptance, said the monument would consecrate the first contact of the soldiers of America with the crushed and bleeding people of France. It was just and appropriate that that date should be perpetuated in stone. "Americans," he cried, "you came to us because you believed it was your duty to come. You obeyed the call of duty, guided by the star of your idealism. You have kept the faith of your souvenir of France of 1778. When the great international struggle overwhelmed the world, you abandoned your isolation and brought across the ocean to the battlefields of France the inspiration of the Stars and Stripes. You came because justice was overthrown and liberty menaced. Nothing can change our recognition of what your soldiers accomplished, or the complete and perfect sacrifice of your women in aiding the wounded and bringing consolation to the dying."

The unveiling ceremonies were followed by a banquet. There were sports in the afternoon, and at night an official dinner and an unforgetable ball at La Boule. In minor ways the festivities were continued three days, and were definitely ended by the official luncheon given by Admiral Chauvin on board the *Voltaire,* which was anchored in the berth occupied by the flagship *Seattle* in June, 1917.

When the guests had left the ship, Admiral Chauvin broke the American flag at the fore and fired a salute of thirteen guns, a very fine and noteworthy compliment in view of the fact that the recipient was *en rétraite,* and the day was Sunday. It was a *beau geste!* Afterwards in reply to a letter of appreciation, Admiral Chauvin wrote: *"J'ai rempli en salutant au canon vôtre depart un devoir qui m'était très agreable."*

Thus the ninth anniversary of the landing of the American troops at St. Nazaire is fraught with lessons which, if heeded by those in high places and elsewhere, would go far toward eliminating the propaganda of gossip and calumny which finds all-too-ready listeners on both sides of the Atiantic, and only tends to cloud the friendship between the two nations, an ancient friendship which is symbolized by the Statue of Liberty, the Yorktown Monument, and the St. Nazaire Memorial.

# Modern Methods *in* Sea *and* Air Navigation

Exit: The "New" Navigation by means of logarithms and natural numbers.
Enter: The "Newest" Navigation by means of inspection tables.

By Commander Radler de Aquino, *Brazilian Navy*
*A. M. U. S. Nav. Inst., M. Braz. Hist. and Geog. Inst., F. Am. Geog. Soc., C. M. Ac. Sc. of Port. and Gold Medallist, Rev. Mar. Braz. (1910)*
*Naval Attaché to the Brazilian Embassy*

"they will last with Exactness as long as God upholdeth the Order and Course of Nature."
ANDREW WAKELY, Math. The Mariner's Compass Rectified: Containing Tables shewing the True Hour of the Day, the Sun being upon any Point of the Compass. London, 1665.

MODERN methods in sea and air navigation may be said to be dated from December 17, 1837, when Captain Thomas H. Sumner, an American ship master, discovered the use and value of a straight line of position, or, as later he so very ably expressed it on the title page of his book: "A New and Accurate Method of Finding a Ship's Position at Sea, by Projection on Mercator's Chart. When the Latitude, Longitude, and Apparent Time, determines, first the true bearing of the land; secondly, the Errors of Longitude by Chronometer, consequent to any error in the Latitude; thirdly, the Sun's True Azimuth. When two altitudes are observed, and the elapsed time noted, the True Latitude is projected; and if the times be noted by chronometer, the True Longitude is also projected at the same operation."[1]

Professor Pierce, Raper, Maury and Lord Kelvin and many others praised Captain Sumner's work and his great discovery.

As early as 1537 Pedro Nunes,[2] the eminent Portuguese cosmographer and mathematician, proposed and solved instrumentally *upon a globe* the problem of finding the latitude by two altitudes of the sun and the angle made by the azimuth circles passing through the sun, when the altitudes were taken.

Later on, when "watches" became more accurate, Robert Hues[3] in 1592 also solved *upon a globe* the problem of finding the latitude by two altitudes and the elapsed time and thereby established the general problem of navigation, but the longitude at sea could not be found with reasonable accuracy for the lack of a "chronometer" or a perfect time-keeper.

## Of Facio's Problem[4]

"In the year 1728 Nicholas Facio Duillier, F.R.S.[5] published a pamphlet, entitled *Navigation Improved*, in which he considered, more at large than had been done before,

[1] Published by Thomas Groom & Co. Boston, 1843. 6th edition in 1866.
[2] *Tratado da sphera com a Theorica do Sol e da Lua.* Lisbon, December 1, 1537.
[3] *Tractatus de globis et eorum usu.* London, 1592. Dutch translation in 1597.
[4] Taken from *The Elements of Navigation*, by John Robertson, F.R.S., late librarian of the Royal Society. 6th Edition, London, 1796, vol. II, pp. 345–47. Of these "Elements"—the leading work on Navigation of the eighteenth century—there are seven editions dated 1754 (a perfect copy of which the writer

the problem for finding the latitude from two observations of the sun's altitude out of the meridian, with the time between them, which he states in the following terms:"

*Problem*

*To find the latitude, by two altitudes of the sun, and the time between them, supposing the observations to have been made from the same place, or from different places, whether at sea or land. And likewise to find the hours, and the sun's azimuths, at the times of both observations.*

Thus he proposes expressly to distinguish between the case, when the two observations are made in the same place, and when, by the motion of the ship, in the interval between them, they are made under different zeniths; which does not appear to have been attempted before. He also extends the interval of time between the observations farther than is usually done, not confining them within the compass of one day; but makes them so remote, that the change in the sun's declination may be necessary to be taken notice of.

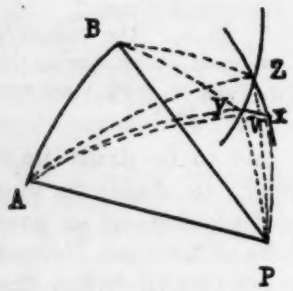


FIG. 1
Projected upon the plane of the Equator

His method of proceeding is this:

Supposing $P$ the elevated pole, $A$ and $B$ the two places of the sun, and $AP$, $PB$, $AB$, arcs of great circles passing through the points $P$, $A$, and $B$. Then if $PA$ be the distance of the sun from the pole $P$ in the first observation, and $PB$ its distance in the second, the angle $APB$ corresponds to the time between the observations, whether that angle represents the whole interval of time or only its difference from one or more entire days, $Z$ also denoting the zenith of the place, when both the observations are under the same.

Here, if the interval of time be large, $AP$ may be different from $PB$. Therefore in the triangle $APB$ from $AP$, $BP$, and the angle $APB$, he finds the side $AB$; then from the three sides $AB$, $BP$, and $AB$, either of the angles $PAB$, $PBA$ may be known; also from $AZ$, $ZB$ and $AB$ in the triangle $AZB$, either of the angles $ABZ$, $BAZ$; and in the last place, from these angles with $ABP$, or $BAP$, may be deduced the angle $ZAP$ or $ZBP$, whence in either of the triangles $PAZ$ or $PBZ$, $PZ$ may be computed, the distance of the zenith $Z$ from the pole.

He likewise further proposes to compute the angles $APZ$, $BPZ$ for assigning the distance of each observation from noon, in order to determine the time of the day when they were respectively made.

All these trigonometrical operations he performs by one axiom (See Art. 251 Book IV) in the doctrine of spherical triangles, which had been applied by others also, not only to the finding of an angle from three sides given, but likewise to the computing of the third side from two sides, and an angle between them.

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found in the Franklin Institute in Philadelphia), 1764, 1772 (a copy of which it was the writer's great pleasure to present to the library of the U. S. Naval Academy, Annapolis, Md.), 1780, 1784, 1796 and 1805 (not mentioned in the Encyclopaedia Britannica, 11th ed.). From the 2nd edition on, these "Elements" contain a very fine history of navigation, up to 1750, by the learned Dr. James Wilson.

Jerome Lalande, the famous French astronomer, declared in his *Abrégé de Navigation*, (Paris, 1793): "C'est le livre le plus complet et le plus utile dans la Marine Anglaise."

[6] Nicholas Facio (J. Nicholas Fatio de Duillier, in the Record of the Royal Society of London, 3rd ed. 1912), a Swiss mathematician of Italian descent and a protégé of Newton, was born at Basel in 1664 and died at Worcester in 1753. He was a Fellow of the Royal Society since 1687. In 1704 he was granted a patent for the application of jewels to pivot holes of watches and clocks.

But when the ship is in motion, $Z$ is not to be considered as the zenith of the ship in either observation. However, in the first observation the ship's zenith will always be in a circle described on $A$, as a pole, and with the interval $AZ$,[6] suppose in $x$, and in the other observation will be in a circle described to the pole $B$ with the interval $BZ$, suppose in $y$, the arch $xy$ denoting the ship's course, making with the meridian of the first observation the angle $Pxy$.

This angle $Pxy$, and the length of the arc $xy$ are to be assigned by the compass and log-line.

Now when the ship has been in motion during the interval between the observations, and these two additional *data* are added to the altitudes of the sun, and the interval of time, Facio proceeds thus:

Having found the point $Z$, as before, he computes in the triangle $AZP$, from $AP$, $AZ$, $PZ$, the angle $AZP$; also in the triangle $BZP$ from $BP$, $BZ$, $PZ$, the angle $BZP$, and from the angles $AZP$, $BZP$, the angle $AZB$, which (the angles $AZx$ and $BZy$ being both right) will be equal to $y\ Z\ x$.

Then supposing the distance run $x\ y$ to be so small an arc that the triangle $x\ Z\ y$ may be considered as rectilinear without any sensible error; and also that the angle $x\ P\ Z$ is so small that $x\ y$ meeting $P\ Z$ in $v$, the angle $P\ v\ y$ may be assumed as not sensibly differing from the angle of the ship's course; whence the angle $BZP$ having been computed, and thence the angle $y\ Z\ v$ known ($B\ Z\ y$ being a right angle) from the angles $y\ Z\ v$ and $Z\ v\ y$ the angle $Z\ y\ x$, which is the complement of the angle which the ship's course makes with $BZ$, will be known; then from the angles $x\ Z\ y$, $Z\ y\ x$, together with the side $y\ x$, he finds the side $Z\ x$; and lastly, in the triangle $P\ x\ Z$ from $x\ Z$, $ZP$, and the angle $xZP$, the side $Px$ is found for the complement of the ship's latitude at the first observation; as also the angle $Z\ P\ x$, and thence the angle $A\ P\ x$, the distance of the observation with the sun in $A$[1] from the meridian in which that observation was made.

And further, Facio considering this computation, though it came very near the truth, as an approximation only, from the assumption of the angles $yxP$, and $Z\ v\ x$, as equal and the triangle $Z\ x\ y$ as rectilinear, he proceeds to correct the latitude, and the angle $x\ P\ Z$ thus found, as follows:

He assumes at pleasure two values for $Z\ x$ (or rather for the arc of a great circle passing through $Z$ and $x$) one somewhat greater, and the other somewhat less, than the value of $Z\ x$ now computed. Then for each value of $Z\ x$, he finds in the triangle $P\ x\ Z$ from the sides $P\ Z$, $Z\ x$, and the angle $P\ Z\ x$, the side $P\ x$ and angle $x\ P\ Z$ and in the triangle $P\ x\ y$ from $P\ x$ now found with $x\ y$, and the angle $P\ x\ y$ given from the course and distance run by the ship from $x$ to $y$, he computes $P\ y$, and the angle $x\ P\ y$. Then from the angles $x\ P\ Z$, $x\ P\ y$ finding the

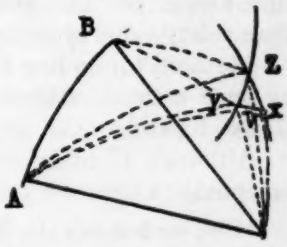



FIG. 2
Projected upon the plane of the Equator

[6] This is the fundamental principle of modern sea and air navigation. In my "Tables" I expressed it as follows: "When a navigator at a given instant of Greenwich (known by a chronometer regulated to mean or sidereal time) observes the altitude of a celestial body, he determines *ipso facto* on the celestial sphere a small circle passing through his zenith." In Facio's days there were no "chronometers" in existence and the problem was essentially a "latitude" problem. Some authors, including the writer, gave Captain Sumner credit for its discovery, but as we see it was not considered a novelty one hundred years before Captain Sumner's time.

angle *y P Z*, and thence *y P B*, at length in the triangle *B P y* from *P B*, *P y*, and the angle *B P y* computes *B y*.

If *B y*, thus computed, comes out equal to *B Z*, then is the value of *Z x*, whence it is deduced, rightly assumed; but if the value in both the computations differ from the truth, *P x* and the angle *Z P x* are to be corrected by the simple rule of false position.[1]

But this method of Facio is attended with an arduous calculation, even though the second correction, which will always be but small, should be neglected. And the expedient proposed by Mr. Graham (*Philosophical Transactions*, No. 435) of observing by an azimuth compass, the angle which the ship's course makes with the azimuth circle of the sun in one of the observations, which has been explained above (Book IX. Article 76) is much more simple."

On December 9, 1731, Mr. Richard Graham, F.R.S., laid before the Royal Society: "The Description and Use of an Instrument for taking the Latitude of a place at any time of the Day" and in the *Phil. Trans.* No. 435 (December, 1734), page 450 he says: "Mr. *Fatio* [*sic*,] F.R.S. (in the year of 1728) proposed a method for finding the latitude, from two or more observations of the sun (or stars) at any time, the distance of the said observations in time, being given by a watch; but as his method requires a vast number of computations, and a great deal of skill in spherical trigonometry, it has very seldom been made use of, and never but by good mathematicians."

Graham's "instrument" was simply a globe properly fitted for solving the above problem and others such as the time of day at sea, etc., and, as Robertson says, "may indeed give the latitude within some minutes of the truth with ease and expedition" (*loc. cit.* vol. II, page 287). Like Facio, in the figures accompanying his exposition, he drew the "arches" of position on his globe to find the observer's zenith.

It was not until the year of 1740 that Cornelius Douwes made known in Holland his approximate solution of this problem by utilizing the latitude by account or dead-reckoning, and his then recently computed logarithmic solar tables found their way to England, in manuscript, through the courtesy of Richard Harrison, who published them in London in 1759.

These logarithmic solar tables were extensively used until the advent of the perfect time-keeper or "chronometer" by John Harrison, in the year of 1765, after more than thirty years of patient and laborious experiments.

Methods for finding *both* latitude and time (longitude) were afterwards propounded by such eminent scientists as Borda, Bowditch, Brünnow, Caillet père, Delambre, Gauss, Lalande, etc.

Although Captain Sumner's book does not contain any quotations (Bowditch[2] excepted), one can readily see that he was familiar with all the important works

[1] Here we find very ably expressed the whole theory of the "method of calculated zenith distances or calculated altitudes" and also the use of "assumed positions."

For an interesting study of the general theory of false position applied to the determination of the observer's position, see Ledieu, *Les Nouvelles Méthodes de Navigation*, Dunod, Editeur, Paris, 1877, pp. 101-07.

[2] Under the title of "Nathaniel Bowditch," Lieutenant G. W. Logan, U. S. Navy, gave us in these PROCEEDINGS for December, 1903, a concise biography of the great American ship-master and mathematician, whose "New American Practical Navigator" is still well known all over the world.

Lieutenant Logan quotes at length from the preface to the original edition, issued in 1802, in which Bowditch tells the story of its origin. He shows how much he owed to John Robertson's "Elements of Navigation", to Dr. Maskelyne's "Requisite Tables" and to John Hamilton Moore's "New Practical Navigator", the first American Edition of which was prepared under Bowditch's own direction and published in 1799.

on navigation, due to the masterly way in which he *later* handled, in his book, his discovery of "the great value of a *single* altitude of the sun, when the latitude is uncertain" (6th edition, pp. 77–78) and explained "the principles upon which this method depends" (pages 52 *et seq.*).

The above *exposé* emphasizes the great service rendered to all navigators by Captain Sumner's happy discovery and a reference to his memory should be found in all works of modern sea and air navigation.

We will not attempt to go through Captain Sumner's work, which should be carefully read by all students of navigation, but we will follow an interesting article by Lord Kelvin (then Sir William Thomson) in the *Proceedings of the Royal Society*, vol. XIX, London, 1871, p. 259, entitled: "On the Determination of a Ship's Place from Observations of Altitude." (Received February 6, 1871).[8]

Our purpose now is to show that the "newest" sea and air navigation by inspection had its birth *four* years before the so-called "new" navigation made its appearance on board the French school-ship *Renommée* and that it is based upon simple principles over a 1,000 years old.[9] A full description of its conception follows:

"The ingenious and excellent idea of calculating the longitude from two different assumed latitudes with one altitude, marking on a chart the points thus found, drawing a line through them, and concluding that the ship was somewhere on that line at the time of the observation, is due to Captain T. H. Sumner. It is now well known to practical navigators. It is described in good books on navigation, as, for instance, Raper's (§§ 1009–14). . . . . I learned it first in 1858 from Captain Moriarty, Royal Navy, on board H.M.S. *Agamemnon*." He further says: "A little experience at sea suggests that it would be very desirable . . . . to abolish calculation, as far as possible, in the ordinary day's work."

Speaking of Commander Thomas Lynn's *Horary Tables for finding the Time by Inspection*, London, 1827, he says: "Tables of this kind have been actually calculated and published but have not come into general use.

"It has occurred to me, however, that by dividing the problem into the solution of two right-angled triangles, it may be practically worked out, so as to give the ship's place as accurately as it can be deduced from the observations, without any calculation at all, by aid of a table of the solution of the 8,100 right-angled spherical triangles of which the legs are integral numbers of degrees.

"On 1870, May 16, afternoon, at 5h 42m Greenwich *apparent time*, the sun's altitude was observed to be 32° 4′; to find the ship's place, the assumed latitude being 54° North.

"The *Nautical Almanac* gives at 1870, May 16, 5h 42m Greenwich *apparent time*, the sun's apparent declination N 19° 10′.

[8] See also "Navigation": A lecture delivered in the City Hall, Glasgow, on Thursday, November 11, 1875; by Sir William Thomson, LL. D., D.C.L., F.R.S., etc. London and Glasgow, 1876 and *Popular Lectures and Addresses* by Sir William Thomson, in 3 vols. Macmillan and Co., London and New York, 1891. On p. 51 of Vol. III—*Navigational Affairs*—he describes "Sumner's Method of Interpreting an Observation of Altitude," very ably expressed.

[9] The writer has been unable to ascertain if these methods were already used 4,200 years ago by "*Noah*, that *Totius Orbis Thalassiarchus*, or High Admiral of the Whole World, with his Ship, called, The *Ark* of *Gopher*, laden with a Cargo of the Whole Universe, after nearly six months voyage, arrived safely at *Ararat*, his Port of Discharge in Armenia." (Joshua Kelly, *The Modern Navigators' Compleat Tutor*. London, 1724, pp. i and ii.)

| | | "Co-hyp." | "A" |
|---|---|---|---|
| $a = 56°$ | 1. $b = 54°10$ | 19° 11′ | 61° 23′—sun's hour angle |
| | $b = 18$ | 32 8 | 78 14 —sun's azimuth (S to W) |
| | 2. $b = 55°$ | 18° 42′ | 61° 5′—sun's hour angle |
| | $b = 19$ | 31 55 | 77 37 —sun's azimuth (S to W) |

from which we have the following:

| | | | | |
|---|---|---|---|---|
| Greenwich apparent time (in arc) | | 85° 30′ | ..... | 85° 30′ |
| sun's hour angle | (1) | 61 23 | .....(2) | 61 5 |
| Diff.—Longitude (auxiliary) | | 24° 7′W | ..... | 24° 25′ |
| sun's altitude (observed | | 32° 4′ | ..... | 32° 4′ |
| sun's altitude (auxiliary) | (1) | 32 8 | .....(2) | 31 55 |
| Diff. | | −4′ | | +9′ |
| sun's declination from N. A. | | 19° 10′ | ..... | 19° 10′ |
| sun's declination (auxiliary) | (1) | 19 11 | .....(2) | 18 42 |
| Diff. | | −1′ | | +28′ |

He works out two more examples with the same data, using assumed latitudes 10° North and 20° South and the altitudes respectively 30° 30′ and 18° 35′, drawing on a chart in each case the line of position from the *assumed* position by means of the difference between the *auxiliary* and the *observed* (true) altitudes and the *auxiliary* azimuths.

It seems that Lord Kelvin, having carefully perused Captain Sumner's book, conceived the idea of computing the hour angle and the azimuth of a heavenly body (and incidentally its altitude) by means of non-logarithmic tables, and comparing this calculated altitude with the true altitude, by shifting the auxiliary Sumner straight line of position parallel to itself, he obtained the Sumner straight line of position for the true altitude.[11] This idea was subsequently lost or forgotten, in view of the complications required to use his set of tables.

It was not until May, 1876—just a little over fifty years ago—that Lord Kelvin was able to publish his *Tables for Facilitating Sumner's Method at Sea.*

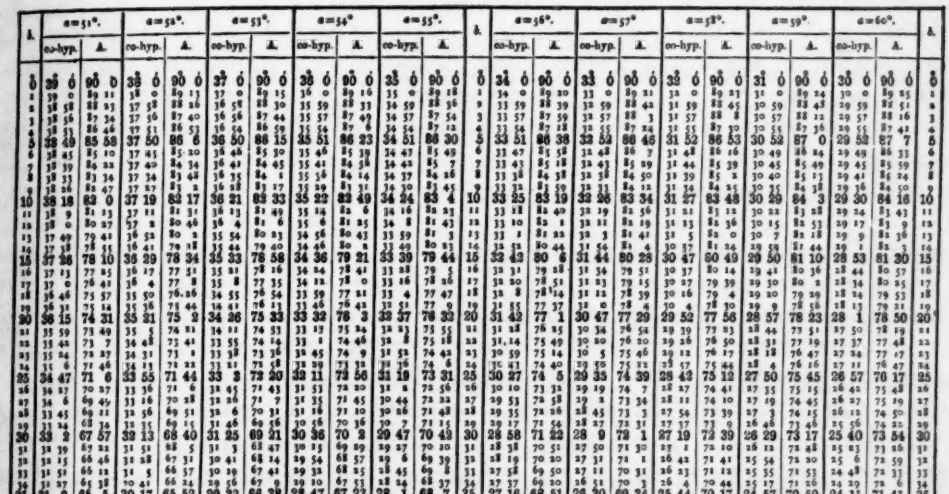
Why his methods and tables did not succeed (although a second edition was published in London in 1886) has been very cleverly explained by Dr. Giuseppe Pesci, in the *Rivista Marittima* for January, 1909, p. 43. Many changes in the methods and and in the tables he devised were necessary before we could arrive at what the writer calls today: "the 'newest' sea and air navigation by means of inspection tables."

[10] Lord Kelvin's *b* is my *c*. He did not name the other leg or side, we call *C*.

[11] It is most interesting and gratifying to notice that Lord Kelvin's idea, which the writer rendered practicable in 1908, has *also* been recently adopted in the new Hydrographic Office publications, known as H.O. 203 and H.O. 204 (dated 1923 and 1925), prepared by G. W. Littlehales, Hydrographic Engineer, but instead of reducing the observations by means of right-angled spherical triangle tables, he revived the excellent and useful *Horary Tables* of Lalande and Lynn (*loc. cit.*) and Lynn's *Azimuth Tables*, London, 1829, adding many new arguments.

Lord Kelvin's "auxiliary Sumner straight line of position" is called "preliminary Sumner line." An integral degree of Latitude is used, to avoid interpolation, as was recommended in 1837 by Captain Sumner, by Lord Kelvin in 1870 and by many others later. Naturally no further reference is made to Marcq Saint Hilaire.

Admiral Marcq Saint Hilaire's work dated, A bord de la *Renommée*, February, 1875, and published in the *Revue Maritime et Coloniale*,[12] Vol. XLVI, August, 1875, pp. 341 and 714, did not appear until *four* years after Lord Kelvin presented his article to the Royal Society.



Photographic reduction of the page of Tables accompanying Lord Kelvin's article, as presented to the Royal Society on February 6, 1871. The same type and disposition was used in his full set of Tables in 9 pages made public on November 11, 1875 and published in May, 1876.

[12] "Calcul du point observé; Méthode des hauteurs estimées." Marcq Saint Hilaire used the estimated or dead-reckoning position and in his calculations he dropped a perpendicular from the body upon the meridian and worked the right-angled spherical triangle formulas by means of logarithms. He was the first to give us the "point Marcq" or "point rapproché"—*the most probable position* of the observer, when only *one* observation is available.

Did Marcq Saint Hilaire, in 1874, know about Lord Kelvin's communication to the Royal Society made public on February 6, 1871?

Besides his reference and praise of Captain Sumner's methods there are no references in Lord Kelvin's works to such methods and tables as Towson's,[13] Deichmann's,[14] Captain Bergen's[15] or Major-General Shortrede's.[16]

Although all these tables were already in existence when Lord Kelvin presented his communication to the Royal Society, they all had in view principally the solution of problems in great circle sailing. Towson showed in 1861 how his tables could be used for finding azimuths. Captain Bergen having familiarized himself with Towson's ex-meridian and great circle sailing tables showed that there were also many problems in navigation and nautical astronomy where minute accuracy was not required, and solved them by means of a set of very interesting spherical tables and a diagram.

Major General Shortrede after a long and tedious study of the right-angled spherical triangle tables or, as he calls those he published, "a Pantaspheric Table", stated "it was not altogether the sort of table for common use at sea by anyone, and thereupon set about the construction of the azimuth tables now published", following the deas already set forth in 1665 by Andrew Wakely (*loc. cit.*).

On p. 170 he states: "By means of a perpendicular, all cases of oblique spherics are reducible to those of right angles, and this table (or rather that of which this is an abridgment) has been used in the regular way for the common and troublesome case of "the sides and contained angle", with results sufficiently exact, but obtained with so much trouble as evidently to be practically useless at sea."

These quotations show the difficulties ahead when Lord Kelvin started.

A Russian edition of his "tables" was published by astronomer Kortazzi in Kronstadt in 1880, of which Collet issued a French edition, in Paris, in 1891. None of these were successful, however, because they followed too closely the original processes of Lord Kelvin, with additional complications.

In 1903 the writer published officially in Rio de Janeiro, in Portuguese, a simplified edition with quite a few changes and improvements, intitled "A Navegação sem Logarithmos" (navigation without logarithms), Imprensa Nacional.

Finally, after presenting to the American public his ideas in these PROCEEDINGS for December, 1908, the writer published in London, in 1910, the first edition of his *Altitude and Azimuth Tables*. A second edition appeared in 1912 greatly improved; reimpressions of this edition were made during the World War, in 1917 and 1918. The third edition, commemorating the centennial of Brazil's Independence, appeared in 1924 with many additions and improvements. This edition was also prepared for

[13] John Thomas Towson, F.R.G.S., *Tables to Facilitate the Practice of Great Circle Sailing*. London, 1847—the pioneer of all tables of right-angled spherics. The writer has only the 6th ed. of 1861. Reprinted in 1916. Sold by J. D. Potter, 145 Minories, London.

[14] A. H. Deichmann, *New Tables to facilitate the Practice of Great Circle Sailing*. London, 1857. Preface dated Hanover, March, 1856.

[15] William Culley Bergen, Master in the Mercantile Marine. *Spherical Tables and Diagram with Their Application to Great Circle Sailing and Various Problems in Nautical Astronomy*. London, 1857. Preface dated Blyth, March 19, 1857.

[16] Major General Robert Shortrede, F.R.A.S., a "Pantaspheric Table" in his *Azimuth and Hour Angle for Latitude and Declination . . . . Together with a Great Circle Sailing Table*. London, 1869. Preface dated February, 1868.

aerial navigation, in view of their successful use in the air by Captain J. P. Ault, Commander of the non-magnetic ship *Carnegie*,[17] in 1918.

### Aquino's "Newest" Sea and Air Navigation Tables.

The writer's ultimate goal for the last twenty-four years[18] has always been to arrange the right-angled spherical triangle tables in such a way that they would present greater advantages than the well-known three argument inspection tables, where you enter with latitude, declination, and hour angle to find the altitude or the azimuth or both or where you enter with the latitude, declination, and altitude to find the hour angle and the azimuth or the position angle.

Due to the particular arrangement of these tables and the number of arguments *two* sets always have to be used: *one* set for the latitude and declination of the *same names* and *another* for the latitude and declination of *contrary names*.

Therefore, they are bulky, heavy, extensive, and expensive, if all the necessary arguments are carried in one, two or more volumes.

We believe we have attained our goal after twenty-four years of close study and patient investigation of the subject.

In only ninety pages—*one* page for each value of $a$—the "perpendicular"—and employing the latest methods available with very simple precepts, or none whatever, the writer hopes to show they represent the ideal navigation tables for use on the sea and in the air. They may be useful in many other problems requiring the use of right-angled spherics and this is the first time the tables appear complete. With *two* arguments above or below, the other *three* unknown quantities in the right-angled spherical triangle are given to the nearest tenth of a minute of arc (within 3″ of arc).

One of the pages, $a = 56°$, with which the examples, as originally given by Lord Kelvin can be worked out, shows the latest disposition of what the writer believes to be "ideal and fool-proof" tables.

The tables were computed by means of *Callet's*[19] *seven* place logarithms, from the following equations:

$$(1)\quad \begin{matrix}\sin d = \cos a \sin b \\ \sin h = \cos a \sin B\end{matrix} \qquad (4)\quad \begin{matrix}\sin a = \cos d \sin t \\ \sin a = \cos h \sin Z\end{matrix}$$

$$(2)\quad \begin{matrix}\cot t = \cot a \cos b \\ \cot Z = \cot a \cos B\end{matrix} \qquad (5)\quad \begin{matrix}\cot b = \cot d \cos t \\ \cot B = \cot h \cos Z\end{matrix}$$

$$(3)\quad \begin{matrix}\cot \alpha = \sin a \tan b \\ \cot \beta = \sin a \tan B\end{matrix} \qquad (6)\quad \begin{matrix}\cot \alpha = \sin d \tan t \\ \cot \beta = \sin h \tan Z\end{matrix}$$

[17] See "On Determination of Position of Airplanes by Astronomical Methods". (Presented before the American Physical Society at Washington, April 25, 1919) and also "Navigation of Aircraft by Astronomical Methods." By J. P. Ault. With 1 plate and 3 figures. 1926. (Extracted from Publication No. 175, Vol. V of the Carnegie Institution of Washington, pp. 315–37). He records "the first known instance of an airplane pilot being informed of his position by astronomical methods," on September 23, 1918 (page 332).

[18] See an article in the *Revista Maritima Brazileira* for October, 1902, intitled "Taboas par achar alturas e azimuths. . . . . " In this article and in my *A Navegação sem Logarithmos* due reference and credit is given to Dr. Börgen for his timely article in the *Annalen der Hydrographie*, no. VII, July, 1902, 336, in which he revived Lord Kelvin's tables and showed how they could be used to find the *estimated* altitude and azimuth in Marcq Saint Hilaire's method. This was the basis of my 1903 edition.

[19] *Tables de logarithmes, suivies d'un recueil de Tables Nautiques.* Editeur Firmin Didot et Cie., Paris, 1883.

| 180° ↓ 225° | 34° | $a = 56° 0'$ | | 0.675 | | 180° ↓ 135° |
|---|---|---|---|---|---|---|
| $b$ | Dec. | | H. A. | | $\alpha$ | c |
| $B$ | Alt. | Var. for 1′ | Az. | Var. for 1′ | $\beta$ | C |
| $\alpha$ | co.H.A. | | co.Dec. | | $b$ | * |
| $\beta$ | co.Az. | | co.Alt. | | $B$ | * |
| 0° | 0° 0.0 | 1.79 | 56° 0.0 | 0.00 | 90° 0.0 | 90° |
| 1 | 0 33.6 | 1.80 | 56 0.2 | .01 | 89 10.3 | 89 |
| 2 | 1 7.1 | 1.80 | 56 1.0 | .02 | 88 20.5 | 88 |
| 3 | 1 40.6 | 1.80 | 56 2.2 | .03 | 87 30.7 | 87 |
| 4 | 2 14.1 | 1.80 | 56 3.9 | .04 | 86 40.9 | 86 |
| 5 | 2 47.6 | 1.80 | 56 6.1 | 0.04 | 85 51.1 | 85 |
| 6 | 3 21.1 | 1.80 | 56 8.7 | .05 | 85 1.2 | 84 |
| 7 | 3 54.5 | 1.80 | 56 11.9 | .06 | 84 11.3 | 83 |
| 8 | 4 27.8 | 1.80 | 56 15.6 | .07 | 83 21.3 | 82 |
| 9 | 5 1.1 | 1.81 | 56 19.7 | .08 | 82 31.2 | 81 |
| 10 | 5 34.3 | 1.81 | 56 24.3 | 0.09 | 81 41.0 | 80 |
| 11 | 6 7.5 | 1.81 | 56 29.5 | .09 | 80 50.7 | 79 |
| 12 | 6 40.6 | 1.82 | 56 35.1 | .10 | 80 0.4 | 78 |
| 13 | 7 13.6 | 1.82 | 56 41.2 | .11 | 79 9.9 | 77 |
| 14 | 7 46.5 | 1.83 | 56 47.8 | .12 | 78 19.3 | 76 |
| 15 | 8 19.3 | 1.83 | 56 54.9 | 0.13 | 77 28.5 | 75 |
| 16 | 8 52.0 | 1.84 | 57 2.5 | .14 | 76 37.7 | 74 |
| 17 | 9 24.6 | 1.85 | 57 10.6 | .14 | 75 46.6 | 73 |
| 18 | 9 57.0 | 1.85 | 57 19.2 | .15 | 74 55.4 | 72 |
| 19 | 10 29.4 | 1.86 | 57 28.3 | .16 | 74 4.1 | 71 |
| 20 | 11 1.6 | 1.88 | 57 37.9 | 0.17 | 73 12.5 | 70 |
| 21 | 11 33.6 | 1.88 | 57 48.1 | .18 | 72 20.8 | 69 |
| 22 | 12 5.5 | 1.89 | 57 58.7 | .19 | 71 28.9 | 68 |
| 23 | 12 37.2 | 1.90 | 58 9.9 | .19 | 70 36.8 | 67 |
| 24 | 13 8.8 | 1.91 | 58 21.5 | .20 | 69 44.4 | 66 |
| 25 | 13 40.2 | 1.92 | 58 33.7 | 0.21 | 68 51.8 | 65 |
| 26 | 14 11.4 | 1.94 | 58 46.4 | .22 | 67 59.0 | 64 |
| 27 | 14 42.4 | 1.95 | 58 59.7 | .23 | 67 6.0 | 63 |
| 28 | 15 13.2 | 1.96 | 59 13.4 | .24 | 66 12.7 | 62 |
| 29 | 15 43.8 | 1.97 | 59 27.7 | .25 | 65 19.2 | 61 |
| 30 | 16 14.2 | 1.99 | 59 42.5 | 0.26 | 64 25.3 | 60 |
| 31 | 16 44.3 | 2.00 | 59 57.9 | .27 | 63 31.2 | 59 |
| 32 | 17 14.2 | 2.02 | 60 13.8 | .27 | 62 36.8 | 58 |
| 33 | 17 43.9 | 2.04 | 60 30.2 | .28 | 61 42.2 | 57 |
| 34 | 18 13.3 | 2.06 | 60 47.2 | .29 | 60 47.2 | 56 |
| 35 | 18 42.5 | 2.09 | 61 4.7 | 0.30 | 59 51.9 | 55 |
| 36 | 19 11.3 | 2.10 | 61 22.8 | .31 | 58 56.3 | 54 |
| 37 | 19 39.9 | 2.12 | 61 41.4 | .32 | 58 0.4 | 53 |
| 38 | 20 8.2 | 2.14 | 62 0.5 | .33 | 57 4.1 | 52 |
| 39 | 20 36.3 | 2.17 | 62 20.2 | .34 | 56 7.5 | 51 |
| 40 | 21 4.0 | 2.20 | 62 40.5 | 0.35 | 55 10.5 | 50 |
| 41 | 21 31.3 | 2.21 | 63 1.3 | .36 | 54 13.2 | 49 |
| 42 | 21 58.4 | 2.25 | 63 22.6 | .37 | 53 15.6 | 48 |
| 43 | 22 25.1 | 2.27 | 63 44.6 | .37 | 52 17.6 | 47 |
| 44 | 22 51.5 | 2.31 | 64 7.0 | .38 | 51 19.2 | 46 |
| 45 | 23 17.5 | | 64 30.1 | | 50 20.4 | 45 |
| $\alpha$ | c | Var. for 1′ | 90°−$a$ | Var. for 1′ | H.A. | * |
| H.A. | $a$ | | $b$ | | $\alpha$ | H.A. |
| 0° ↑ 45° | sin 0.829 | | 56° 0′ | | cos 0.559 | 360° ↑ 315° |
| | Latitude or Declination | | | | | |

| 225° ↓ 270° | 34° | $a = 56° 0'$ | | 0.675 | | 135° ↓ 90° |
|---|---|---|---|---|---|---|
| $b$ | Dec. | | H. A. | | $\alpha$ | c |
| $B$ | Alt. | Var. for 1′ | Az. | Var. for 1′ | $\beta$ | C |
| $\alpha$ | co.H.A. | | co.Dec. | | $b$ | * |
| $\beta$ | co.Az. | | co.Alt. | | $B$ | * |
| 45° | 23°17.5 | 2.35 | 64°30.1 | 0.39 | 50°20.4 | 45° |
| 46 | 23 43.1 | 2.37 | 64 53.7 | .40 | 49 21.2 | 44 |
| 47 | 24 8.4 | 2.41 | 65 17.8 | .41 | 48 21.7 | 43 |
| 48 | 24 33.3 | 2.44 | 65 42.5 | .42 | 47 21.8 | 42 |
| 49 | 24 57.8 | 2.50 | 66 7.8 | .43 | 46 21.5 | 41 |
| 50 | 25 21.8 | 2.53 | 66 33.6 | 0.44 | 45 20.7 | 40 |
| 51 | 25 45.5 | 2.59 | 67 0.0 | .45 | 44 19.6 | 39 |
| 52 | 26 8.7 | 2.63 | 67 26.9 | .46 | 43 18.1 | 38 |
| 53 | 26 31.5 | 2.70 | 67 54.4 | .47 | 42 16.2 | 37 |
| 54 | 26 53.9 | 2.75 | 68 22.4 | .48 | 41 13.8 | 36 |
| 55 | 27 15.7 | 2.80 | 68 51.0 | 0.48 | 40 11.1 | 35 |
| 56 | 27 37.1 | 2.86 | 69 20.1 | .49 | 39 7.9 | 34 |
| 57 | 27 58.1 | 2.94 | 69 49.7 | .50 | 38 4.4 | 33 |
| 58 | 28 18.5 | 3.00 | 70 19.9 | .51 | 37 0.4 | 32 |
| 59 | 28 38.5 | 3.09 | 70 50.6 | .52 | 35 56.0 | 31 |
| 60 | 28 57.9 | 3.17 | 71 21.8 | 0.53 | 34 51.2 | 30 |
| 61 | 29 16.8 | 3.21 | 71 53.5 | .54 | 33 46.0 | 29 |
| 62 | 29 35.2 | 3.37 | 72 25.7 | .55 | 32 40.5 | 28 |
| 63 | 29 53.0 | 3.46 | 72 58.5 | .55 | 31 34.5 | 27 |
| 64 | 30 10.3 | 3.57 | 73 31.7 | .56 | 30 28.1 | 26 |
| 65 | 30 27.1 | 3.73 | 74 5.4 | 0.57 | 29 21.4 | 25 |
| 66 | 30 43.2 | 3.85 | 74 39.5 | .58 | 28 14.3 | 24 |
| 67 | 30 58.8 | 4.00 | 75 14.1 | .58 | 27 6.8 | 23 |
| 68 | 31 13.8 | 4.17 | 75 49.2 | .59 | 25 58.9 | 22 |
| 69 | 31 28.2 | 4.35 | 76 24.7 | .60 | 24 50.7 | 21 |
| 70 | 31 42.0 | 4.55 | 77 0.6 | 0.60 | 23 42.2 | 20 |
| 71 | 31 55.2 | 4.80 | 77 36.9 | .61 | 22 33.3 | 19 |
| 72 | 32 7.7 | 5.00 | 78 13.6 | .62 | 21 24.1 | 18 |
| 73 | 32 19.7 | 5.35 | 78 50.6 | .62 | 20 14.6 | 17 |
| 74 | 32 30.9 | 5.61 | 79 28.1 | .63 | 19 4.8 | 16 |
| 75 | 32 41.6 | 6.00 | 80 5.8 | 0.63 | 17 54.7 | 15 |
| 76 | 32 51.6 | 6.45 | 80 43.9 | .64 | 16 44.3 | 14 |
| 77 | 33 0.9 | 7.00 | 81 22.3 | .64 | 15 33.7 | 13 |
| 78 | 33 9.6 | 7.50 | 82 1.0 | .65 | 14 22.8 | 12 |
| 79 | 33 17.6 | 8.22 | 82 40.0 | .65 | 13 11.7 | 11 |
| 80 | 33 24.9 | 9.09 | 83 19.2 | 0.66 | 12 0.4 | 10 |
| 81 | 33 31.5 | 10.0 | 83 58.6 | .66 | 10 48.9 | 9 |
| 82 | 33 37.5 | 11.5 | 84 38.2 | .66 | 9 37.3 | 8 |
| 83 | 33 42.7 | 13.0 | 85 18.0 | .67 | 8 25.5 | 7 |
| 84 | 33 47.3 | 15.4 | 85 58.0 | .67 | 7 13.5 | 6 |
| 85 | 33 51.2 | 18.8 | 86 38.1 | 0.67 | 6 1.4 | 5 |
| 86 | 33 54.4 | 25.0 | 87 18.4 | .67 | 4 49.3 | 4 |
| 87 | 33 56.8 | 33.3 | 87 58.7 | .67 | 3 37.0 | 3 |
| 88 | 33 58.6 | 60.0 | 88 39.1 | .67 | 2 24.7 | 2 |
| 89 | 33 59.6 | 150.0 | 89 19.5 | .68 | 1 12.4 | 1 |
| 90 | 34 0.0 | | 90 0.0 | | 0 0.0 | 0 |
| $\alpha$ | c | Var. for 1′ | 90°−$a$ | Var. for 1′ | H.A. | * |
| H.A. | $a$ | | $b$ | | $\alpha$ | H.A. |
| 45° ↑ 90° | sec 1.788 | | 56° 0′ | | cosec 1.206 | 315° ↑ 270° |
| | Latitude or Declination | | | | | |

The notations contained in these equations are easily understood by looking at the figure below, where the triangle of position is projected upon the plane of observer's horizon.

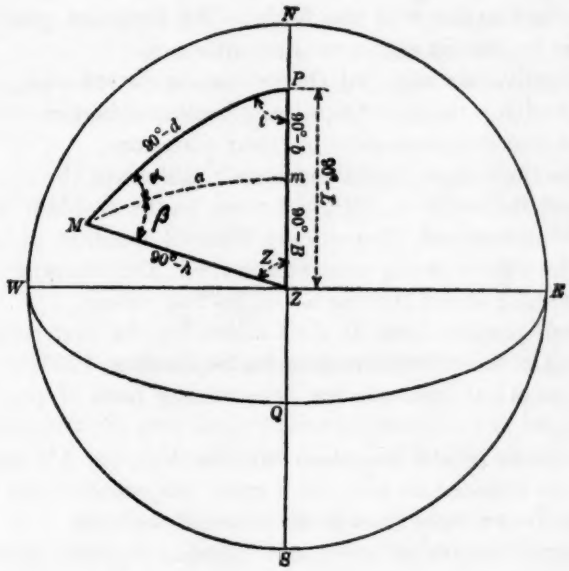



FIG. 3
Projected upon the plane of the observer's horizon

The following precepts show the relations between various elements of the triangle of position:

Lat. and Dec. same names
- H. A. less than 90°
  - $L$ less than $b$ : $C=b-L$, $M=\alpha+\beta$, $Z$ less than 90°
  - $L$ greater than $b$: $C=L-b$, $M=\alpha-\beta$, $Z$ greater than 90°
- H. A. greater than 90°.....: $C=L+b$, $M=\beta-\alpha$, $Z$ less than 90°

Lat. and Dec. contrary names .....: $C=L+b$, $M=\alpha+\beta$, $Z$ greater than 90°

The above precepts given in order to avoid algebraic signs and arcs greater than 90°, may be reduced to the following, in practice:

Lat. and Dec. same names and H. A. less than 90°: $C=L\sim b$
Other cases.....$C=L+b$

in view of the fact that the quadrant in which the body is observed is *always* known *a priori*.

Equations (1), (2) and (3) were used to find Dec., H. A. and $\alpha$ from $a$ and $b$ (*Upper arguments*).

We can also find Alt., Az. and $\beta$ from $a$ and $B$.

We can also find co. H. A., co. Dec. and $b$ from $a$ and $\alpha$.

We can also find co. Az., co. Alt. and $B$ from $a$ and $\beta$.

Equations (4), (5) and (6) were used to find $a$, $b$ and $\alpha$ from Dec. and H. A. (*Lower arguments.*).

We can also find $c$, $90°-a$ and H. A. from Dec. and $\alpha$.

The interchanging of the *upper* arguments $b$ and $\alpha$ (and $B$ and $\beta$), practically doubles the number of arguments, without increasing the volume of the tables.

The *lower* arguments are not really needed in our methods, except to obtain the approximate values of the *upper* arguments to facilitate the entry in the tables and to allow the use of them in connection with the other methods referred to on page 33.

This all shows the elasticity of the tables. As they are *general* and *accurate* in their nature they can be used in a great variety of ways.

The writer, naturally, has adapted them first for determining lines of position at sea and in the air and for the identification of celestial bodies, and second for great circle sailing and for the determination of lunar distances.

For these reasons the values appearing in our tables are the complements of those contained in Towson's Great Circle Sailing Tables, as the problem of great circle sailing is secondary to the problem of determining lines of position at sea and in the air. Towson only gave the values to the nearest minute of arc, whereas we give them to the nearest tenth of a minute of arc (within 3″ of its *true* value).

The tables in their present form as shown here for the first time, slightly different from those appearing in these PROCEEDINGS for September, 1913, p. 1031, are available for three different practical methods for determining lines of position at sea and in the air:

1. When use is made of the variation factors (Var. for 1′) whereby the altitude difference can *also* be reduced to zero, in a great majority of the cases, allowing the line of position to be drawn right *through* the *assumed* position.

2. When an integral degree of latitude is *assumed* and the position angle becomes necessary to correct the tabular altitude for the *odd* minutes of declination.

3. When the use of an integral degree of latitude is not desirable or practicable, which generally happens when the observed body is near the meridian or near the zenith—or when a change of latitude will give a small altitude difference or even reduce it to zero.

These tables are also available for use with any of the methods devised by Souillagouët,[20] Delafon,[21] Fuss,[22] or Bertin.[23]

## EXAMPLES

Lord Kelvin worked from data taken in the same *a* column or in adjacent *a* columns, according to the values of the data given. Only one value of *a* is necessary and all the data required can be found on *one* single page, as in the three argument tables.

*First Method.* *a* and *C* as integral numbers. Same example as Lord Kelvin's on page 22, using the variation factors (Var. for 1′).

$L_A = 53°\ 57.3$N  Ass. Dec. $= 19°\ 11.3$N  G.H.A. $= 85°\ 30'$

$a = 56°\ 0'$ { $b = 35\ 57.3$ ; $C = 18°\ 0.0$ }

.... Dec. $= 19\ 10$ .....Ass. H. A. $= 61\ 22.0$

Diff. $= -1.3$  Ass. Long. $= 24°\ 8.0$W

Ass. Alt. $= 32°\ 7.7$ ..... Az. $= 78°\ 13.6$ SW

True Alt. $= 32\ 4$

Alt. Diff. $= -\ 3.7$

[20] *Tables du Point Auxiliaire.* Paris, July, 1891. Second and last edition at Toulouse, 1900. Table III was used by Lieutenant Leblanc in his non-logarithmic method.

[21] *Méthode rapide pour déterminer les Droites et Courbes de Hauteur et faire le Point.* Berger-Levrault et Cie., Editeurs, Paris, 1893.

[22] *Tablitzi dlya Nakashdeniya Visott i Azimutoff.* Typography of the Imperial Academy of Sciences. Saint Petersburg, 1901.

[23] Extrait de la Table de Point Sphérique. Pour calculer à la Mer vite et sans erreur. Imprimerie Oberthur. Rennes, 1918.

This is the writer's original modification of the process devised by Lord Kelvin in 1870, and, in a way, it is the *simplest* of all and was first described in these PROCEEDINGS for December, 1908.

A slight modification of the above method can be made, if we wish to reduce the Alt. Diff. to zero, by means of the variation factors (Var. for 1′).

It can be most advantageously used when the azimuth is less than 60°, and the writer and many other navigators have used it, with good results, on azimuths up to 79°.

$a = 56°\ 0'$ { $b = 35°\ 57'.3\ldots$ ; $C = 18\ \ 18.5\ldots$ ; $L_A = 54°\ 15'.8$N.

Ass. Dec. $= 19°\ 11'.3$N  G.H.A. $= 85°\ 30'$
Dec. $= 19\ \ 10.\ldots$  Ass. H.A. $= 61\ \ 22.0$
Tab. Diff. $= -\ \ 1'.3$  Ass. Long. $= 24°\ \ 8'.0$W
Ass. Alt. $= 32°\ \ 7'.7$
True Alt. $= 32\ \ 4\ \ \ldots$  Az. $= 78°\ \ 2'.1$SW
Tab. Diff. $= -\ \ 3'.7$

By adding or subtracting $b$ and $C$ from one another we find $L_A$. No precepts are necessary.

The "altitude-difference" is zero and the line of position can be drawn *right through* the assumed position: $L_A = 54°\ 15'.8$N and $G_A = 24°\ 8'.0$W, as shown on our "Protractor Diagram".

*Second Method.* $a$, $b$ and $C$ as integral numbers. Same example as above using an integral degree for the latitude. This is the writer's modification of the *First Method* published in 1912, in the second edition of his *Altitude and Azimuth Tables.*

$a = 56°0'$ { $b = 36\ldots$ ; $C = 18°\ldots$

$L_A = 54°$N  Dec. $= 19°\ 10'$ N  G.H.A. $= 85°\ 30'$
Ass. Dec. $= 19\ \ 11.3\ldots$  Ass. H.A. $= 61\ \ 22.8\ldots$  $\alpha = 58°.9$ $(58°56'.3)$
Diff. $= -\ \ 1'.3$  Ass. Long. $= 24°\ \ 7'.2$W
Alt. $= 32°\ \ 7'.7\ldots$  Az. $= 78°\ 13'.6$SW.  $\beta = 21.4$ $(21\ 24.1)$
$\Delta h = -\ \ 1.0$  M $= 37'.5$
Ass. Alt. $= 32°\ \ 6.7$
True Alt. $= 32\ \ 4$
Alt. Diff. $= -\ \ 2'.7$

*Third Method.* Same example as above, using as arguments $a$ and $\alpha$, as integral numbers or $a$ and $\beta$, as integral numbers. In order to avoid interpolation $C$ is *always* used as an integral number in the first process.

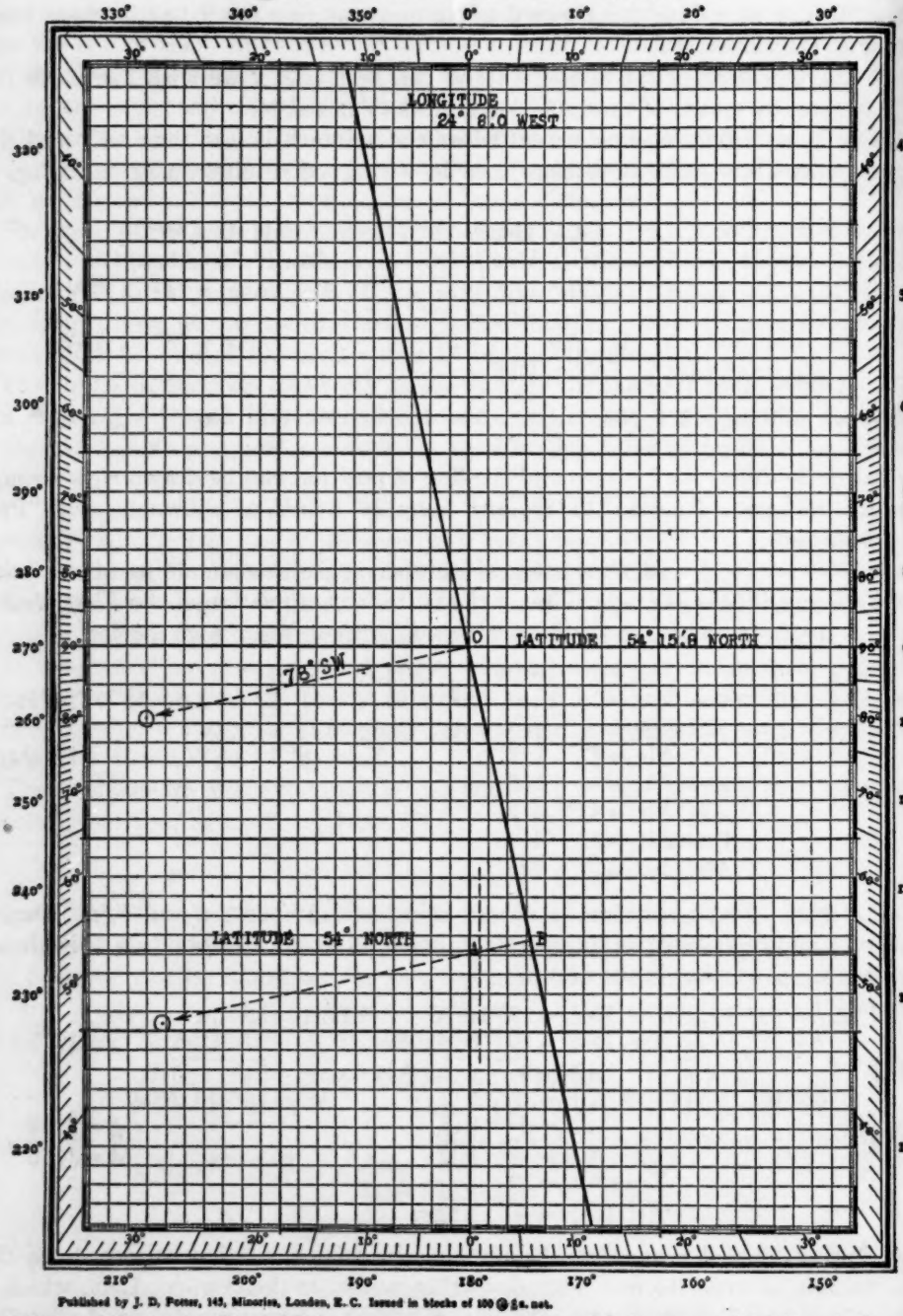
$a = 56°\ 0'$ { $b = 35\ \ 56.0$ ; $C = 18°\ \ 0'.0$

$L_A = 53°\ 56'.0$N  Dec. $= 19°\ 10'$N  G.H.A. $= 85°\ 30'$
Ass. Dec. $= 19\ \ 9.4$  Ass. H. A. $= 61\ \ 21.5$  $\alpha = 59°$
Diff. $= +\ \ 0'.6$  Ass. Long. $= 24°\ \ 8'.5$W
Alt. $= 32°\ \ 7'.7$  Az. $= 78°\ 13'.6$SW
$\Delta h = +\ \ 0.5$  $\beta = 21.4$
Ass. Alt. $= 32°\ \ 8'.2$  M $= 37'.6$
True Alt. $= 32\ \ 4$
Alt. Diff. $= -\ \ 4'.2$

*First Process.* $a$ and $\alpha$ as integral numbers. In this calculation we run down the co. Dec. column in order to find a *tabular* value *nearest to* the true co. Dec., which is 70° 50′ and we find 70° 50′.6. We take $b = 35°\ 56'.0$ right alongside, to the left co. H. A. $= 28°\ 38'.5$ or H.A. $= 61°\ 21'.5$, and also outside $\alpha = 59°$. $C$ is found as usual from $L$ and $b$ and the rest is the same as in all the methods.

*Second Process.* $a$ and $\beta$ as integral numbers. Instead of taking $L = 53°\ 56'.0$, which combined with $b = 35°\ 56'.0$ gave us $C = 18°$, we can enter the tables *inside*, as

## AQUINO'S PROTRACTOR DIAGRAM




Published by J. D. Potter, 145, Minories, London, E. C. Issued in blocks of 100 @ 5s. net.

When the "altitude-difference" is zero the line of position OB is drawn *right through* the assumed position: latitude 54° 15′.8 North and longitude 24° 8′.0 West. This permits the line of position to be drawn accurately and avoids the necessity of drawing a perpendicular. The dotted lines showing the direction of the sun from each assumed position need not be drawn.

Our "Protractor Diagram" is a position finding chart good for *all* latitudes and when it is used together with our "Graduated Triangle" the longitude scales are obtained immediately by simply adjusting the "graduated triangle" on the "Protractor Diagram." See "Wrinkles in Plane Chart Methods" in these PROCEEDINGS, Vol. 40, No. 2, Whole No. 150; March-April, 1914.

before, and find $B=71°\ 28'.9$, co. Az. $=12°\ 5'.5$ or $77°\ 54'.5$ and co. Alt. $=57°\ 58'.7$ or Alt. $=32°\ 1'.3$ and also outside $\beta=22°$.

Combining $B=71°\ 28'.9$ ($C=18°\ 31'.1$) with $b=35°\ 56'.0$, we would have $L_A=54°\ 27'.1$. By adding or subtracting $b$ and $C$ from one another we find $L_A$. No precepts are necessary in this process.

Above we have given *three* practical methods for finding lines of position at sea and in the air. The first two have had a wide acceptance all over the world, ever since the writer published them in 1910 and 1912.

By a happy coincidence in the *first process* of the *third method* above, the *tabular* co. Dec. is practically the same as the *true* co. Dec. and, in ordinary practice, especially in the air, no correction would have to be applied to the *tabular* altitude, and therefore $M$ would not have to be found from $\alpha$ and $\beta$.

The advantages of the new third method, with its two processes, do not become very apparent until the declinations and the altitudes are high (over 70°), as then to small changes of $b$ or $B$ in the tables correspond still smaller changes in co. Dec. or co. Alt. and the use of tedious interpolations is avoided and accuracy in the result is assured.

Page $a=5°\ 0'$ is given to show this great advantage. Let the kind reader work out one of his high-altitude ex-meridians by means of this page and see the difference!

As the only calculation affecting the accuracy of the results (by which we mean the assumed altitude within 0'.1, and the assumed longitude within 0'.05 and the assumed Latitude within 0'.1, whenever it is not an integral degree—exact in itself) is the correction of the *tabular* altitude for the *odd* minutes of declination by means of the position angle $M$, it is always desirable to find a value of Dec. or co. Dec. nearest to the true value.

### PRECEPTS LINKING $L$, $b$ AND $C$ OR $L$, $c$ AND $B$.

The use of our simple precepts in order to avoid the use of algebraic signs and arcs greater than 90° has always been encouraged by several distinguished mathematicians, and the writer succeeded in reducing the necessary precepts to *only* two covering the four possible cases—the same as those used for over a century in connection with the versine and haversine formulas.

Those who favor the adoption of 3 argument Tables point against these two very simple precepts.

The writer has succeeded in overcoming this by using TWO copies of his Tables—*one* for Lat. and Dec. Same names: H. A. less than 90° and *one* for contrary names and H. A. greater than 90°.

One copy would be marked "Lat. and Dec. Same Names: H. A. less than 90°" and $B$ would be *always* $L+c$ or $C$ would be *always* $L\sim b$.

Another *duplicate* copy would be marked "Contrary Names and H. A. greater than 90°" and $C$ would be *always* $L+b$ or $B$ would be *always* $L\sim c$.

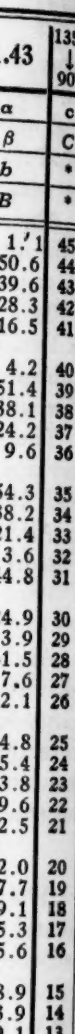
In this simple way, with only ninety pages of tables we would obtain greater advantages than the three argument tables can offer. But is it really worth while to use two sets of tables to avoid our simple precepts?

### IDENTIFICATION OF CELESTIAL BODIES

The problem of identifying celestial bodies is the reverse of the problem of determining altitude and azimuth. That is given: Alt., Az. and Lat. find Dec. and H. A.

| 180° ↓ 225° | 85° | $a = 5° 0'$ | | 11.43 | | 180° ↓ 135° |
|---|---|---|---|---|---|---|
| $b$ | Dec. | | H.A. | | $\alpha$ | $c$ |
| $B$ | Alt. | Var. for 1′ | Az. | Var. for 1′ | $\beta$ | $C$ |
| $\alpha$ | co.H.A. | | co.Dec. | | $b$ | * |
| $\beta$ | co.Az. | | co.Alt. | | $B$ | * |
| 0° | 0° 0.′0 | 1.00 | 5° 0.′0 | 0.00 | 90° 0.′0 | 90° |
| 1 | 0 59.8 | 1.01 | 5 0.0 | .00 | 89 54.8 | 89 |
| 2 | 1 59.5 | 1.00 | 5 0.2 | .00 | 89 49.5 | 88 |
| 3 | 2 59.3 | 1.00 | 5 0.4 | .01 | 89 44.3 | 87 |
| 4 | 3 59.1 | 1.00 | 5 0.7 | .01 | 89 39.0 | 86 |
| 5 | 4 58.9 | 1.01 | 5 1.1 | 0.01 | 89 33.8 | 85 |
| 6 | 5 58.6 | 1.00 | 5 1.6 | .01 | 89 28.5 | 84 |
| 7 | 6 58.4 | 1.00 | 5 2.2 | .01 | 89 23.2 | 83 |
| 8 | 7 58.2 | 1.01 | 5 2.9 | .01 | 89 17.9 | 82 |
| 9 | 8 57.9 | 1.00 | 5 3.7 | .02 | 89 12.5 | 81 |
| 10 | 9 57.7 | 1.00 | 5 4.6 | 0.02 | 89 7.2 | 80 |
| 11 | 10 57.5 | 1.01 | 5 5.6 | .02 | 89 1.8 | 79 |
| 12 | 11 57.2 | 1.00 | 5 6.7 | .02 | 88 56.3 | 78 |
| 13 | 12 57.0 | 1.01 | 5 7.8 | .02 | 88 50.8 | 77 |
| 14 | 13 56.7 | 1.00 | 5 9.1 | .02 | 88 45.3 | 76 |
| 15 | 14 56.5 | 1.01 | 5 10.5 | 0.03 | 88 39.7 | 75 |
| 16 | 15 56.2 | 1.00 | 5 12.0 | .03 | 88 34.1 | 74 |
| 17 | 16 56.0 | 1.00 | 5 13.6 | .03 | 88 28.4 | 73 |
| 18 | 17 55.8 | 1.01 | 5 15.4 | .03 | 88 22.7 | 72 |
| 19 | 18 55.5 | 1.01 | 5 17.2 | .03 | 88 16.9 | 71 |
| 20 | 19 55.2 | 1.00 | 5 19.1 | 0.04 | 88 11.0 | 70 |
| 21 | 20 55.0 | 1.01 | 5 21.2 | .04 | 88 5.0 | 69 |
| 22 | 21 54.7 | 1.01 | 5 23.4 | .04 | 87 59.0 | 68 |
| 23 | 22 54.4 | 1.00 | 5 25.8 | .04 | 87 52.9 | 67 |
| 24 | 23 54.2 | 1.01 | 5 28.2 | .04 | 87 46.7 | 66 |
| 25 | 24 53.9 | 1.01 | 5 30.8 | 0.05 | 87 40.4 | 65 |
| 26 | 25 53.6 | 1.01 | 5 33.6 | .05 | 87 34.0 | 64 |
| 27 | 26 53.3 | 1.01 | 5 36.5 | .05 | 87 27.4 | 63 |
| 28 | 27 53.0 | 1.00 | 5 39.5 | .05 | 87 20.8 | 62 |
| 29 | 28 52.8 | 1.01 | 5 42.7 | .06 | 87 14.0 | 61 |
| 30 | 29 52.5 | 1.01 | 5 46.1 | 0.06 | 87 7.2 | 60 |
| 31 | 30 52.1 | 1.01 | 5 49.7 | .06 | 87 0.1 | 59 |
| 32 | 31 51.8 | 1.01 | 5 53.4 | .07 | 86 53.0 | 58 |
| 33 | 32 51.5 | 1.01 | 5 57.3 | .07 | 86 45.6 | 57 |
| 34 | 33 51.2 | 1.01 | 6 1.4 | .07 | 86 38.1 | 56 |
| 35 | 34 50.8 | 1.01 | 6 5.8 | 0.08 | 86 30.5 | 55 |
| 36 | 35 50.5 | 1.01 | 6 10.3 | .08 | 86 22.6 | 54 |
| 37 | 36 50.2 | 1.01 | 6 15.1 | .08 | 86 14.5 | 53 |
| 38 | 37 49.8 | 1.01 | 6 20.1 | .09 | 86 6.3 | 52 |
| 39 | 38 49.4 | 1.01 | 6 25.4 | .09 | 85 57.8 | 51 |
| 40 | 39 49.0 | 1.01 | 6 30.9 | 0.10 | 85 49.0 | 50 |
| 41 | 40 48.6 | 1.01 | 6 36.7 | .10 | 85 40.0 | 49 |
| 42 | 41 48.2 | 1.01 | 6 42.9 | .11 | 85 30.8 | 48 |
| 43 | 42 47.8 | 1.01 | 6 49.3 | .11 | 85 21.2 | 47 |
| 44 | 43 47.4 | 1.01 | 6 56.1 | .12 | 85 11.3 | 46 |
| 45 | 44 46.9 | | 7 3.2 | | 85 1.1 | 45 |
| $\alpha$ | $c$ | Var. for 1′ | $90° - a$ | Var. for 1′ | H.A. | * |
| H.A. | $a$ | | $b$ | | $\alpha$ | H.A. |
| 0° ↑ 45° | sin 0.087 | | $5° 0'$ | | cos 0.996 | 360° ↑ 315° |
| | Latitude or Declination | | | | | |

| 225° ↓ 270° | 85° | $a = 5° 0'$ | | 11.43 | | 135° ↓ 90° |
|---|---|---|---|---|---|---|
| $b$ | Dec. | | H.A. | | $\alpha$ | $c$ |
| $B$ | Alt. | Var. for 1′ | Az. | Var. for 1′ | $\beta$ | $C$ |
| $\alpha$ | co.H.A. | | co.Dec. | | $b$ | * |
| $\beta$ | co.Az. | | co.Alt. | | $B$ | * |
| 45° | 44° 46.′9 | 1.01 | 7° 3.′2 | 0.13 | 85° 1.′1 | 45° |
| 46 | 45 46.5 | 1.01 | 7 10.7 | .13 | 84 50.6 | 44 |
| 47 | 46 46.0 | 1.01 | 7 18.6 | .14 | 84 39.6 | 43 |
| 48 | 47 45.5 | 1.01 | 7 26.9 | .15 | 84 28.3 | 42 |
| 49 | 48 45.0 | 1.01 | 7 35.8 | .15 | 84 16.5 | 41 |
| 50 | 49 44.5 | 1.01 | 7 45.0 | 0.16 | 84 4.2 | 40 |
| 51 | 50 43.9 | 1.01 | 7 54.9 | .17 | 83 51.4 | 39 |
| 52 | 51 43.3 | 1.01 | 8 5.3 | .18 | 83 38.1 | 38 |
| 53 | 52 42.7 | 1.01 | 8 16.3 | .19 | 83 24.2 | 37 |
| 54 | 53 42.1 | 1.01 | 8 28.0 | .21 | 83 9.6 | 36 |
| 55 | 54 41.4 | 1.01 | 8 40.4 | 0.22 | 82 54.3 | 35 |
| 56 | 55 40.7 | 1.01 | 8 53.5 | .23 | 82 38.2 | 34 |
| 57 | 56 39.9 | 1.01 | 9 7.5 | .25 | 82 21.4 | 33 |
| 58 | 57 39.2 | 1.02 | 9 22.5 | .26 | 82 3.6 | 32 |
| 59 | 58 38.3 | 1.01 | 9 38.4 | .28 | 81 44.8 | 31 |
| 60 | 59 37.5 | 1.02 | 9 55.5 | 0.30 | 81 24.9 | 30 |
| 61 | 60 36.5 | 1.02 | 10 13.8 | .33 | 81 3.9 | 29 |
| 62 | 61 35.6 | 1.02 | 10 33.4 | .35 | 80 41.5 | 28 |
| 63 | 62 34.5 | 1.02 | 10 54.5 | .38 | 80 17.6 | 27 |
| 64 | 63 33.4 | 1.02 | 11 17.2 | .41 | 79 52.1 | 26 |
| 65 | 64 32.2 | 1.02 | 11 41.8 | 0.44 | 79 24.8 | 25 |
| 66 | 65 30.9 | 1.03 | 12 8.4 | .48 | 78 55.4 | 24 |
| 67 | 66 29.5 | 1.03 | 12 37.3 | .52 | 78 23.8 | 23 |
| 68 | 67 28.0 | 1.03 | 13 8.7 | .57 | 77 49.6 | 22 |
| 69 | 68 26.3 | 1.03 | 13 43.2 | .63 | 77 12.5 | 21 |
| 70 | 69 24.6 | 1.04 | 14 20.9 | 0.69 | 76 32.0 | 20 |
| 71 | 70 22.6 | 1.04 | 15 2.5 | .77 | 75 47.7 | 19 |
| 72 | 71 20.4 | 1.04 | 15 48.5 | .85 | 74 59.1 | 18 |
| 73 | 72 18.0 | 1.04 | 16 39.6 | .95 | 74 5.3 | 17 |
| 74 | 73 15.4 | 1.05 | 17 36.6 | 1.07 | 73 5.6 | 16 |
| 75 | 74 12.4 | 1.06 | 18 40.6 | 1.20 | 71 58.9 | 15 |
| 76 | 75 9.0 | 1.07 | 19 52.9 | 1.37 | 70 43.9 | 14 |
| 77 | 76 5.2 | 1.08 | 21 15.1 | 1.57 | 69 19.1 | 13 |
| 78 | 77 0.8 | 1.09 | 22 49.3 | 1.81 | 67 42.3 | 12 |
| 79 | 77 55.8 | 1.09 | 24 37.9 | 2.11 | 65 51.0 | 11 |
| 80 | 78 49.9 | 1.13 | 26 44.4 | 2.48 | 63 41.9 | 10 |
| 81 | 79 42.9 | 1.16 | 29 13.0 | 2.94 | 61 10.6 | 9 |
| 82 | 80 34.5 | 1.20 | 32 9.3 | 3.52 | 58 11.7 | 8 |
| 83 | 81 24.3 | 1.27 | 35 40.4 | 4.25 | 54 37.9 | 7 |
| 84 | 82 11.7 | 1.35 | 39 55.7 | 5.18 | 50 20.0 | 6 |
| 85 | 82 56.0 | 1.50 | 45 6.6 | 6.32 | 45 6.6 | 5 |
| 86 | 83 36.0 | 1.75 | 51 26.0 | 7.68 | 38 44.4 | 4 |
| 87 | 84 10.3 | 2.28 | 59 6.7 | 9.14 | 31 1.1 | 3 |
| 88 | 84 37.0 | 3.51 | 68 15.2 | 10.5 | 21 50.1 | 2 |
| 89 | 84 54.1 | 10.2 | 78 43.1 | 11.3 | 11 19.5 | 1 |
| 90 | 85 0.0 | | 90 0.0 | | 0 0.0 | 0 |
| $\alpha$ | $c$ | Var. for 1′ | $90° - a$ | Var. for 1′ | H.A. | * |
| H.A. | $a$ | | $b$ | | $\alpha$ | H.A. |
| 45° ↑ 90° | sec 1.004 | | $5° 0'$ | | cosec 11.47 | 315° ↑ 270° |
| | Latitude or Declination | | | | | |




### Great Circle Sailing

The problem of finding distance and course in great circle sailing may also be easily solved by these tables, because it is the same as determining altitude and azimuth. The distance corresponds to the zenith distance or co. Alt. and the course to the azimuth. The only difference is that the distance between the two given points can be greater than 90°, whereas the zenith distance cannot be greater than 90°.

If we wish to find a number of points along a great circle and the course therefrom, it is better to determine the "latitude of its vertex."

If we take as the "latitude of the vertex", the small blackfaced number at the top (near *a*—the perpendicular), we will find the Latitude in column Dec., the Course in the column H.A., the longitude from vertex in column $\alpha$ and the distance in column *c*.

In this way we may use, to great advantage, the methods contained in Towson's and Bergen's Tables.

### Lunar Distances

The problem of finding lunar distances (*whenever necessary*) is the same as the problem of determining zenith distance for lines of position or of finding distance in great circle sailing, as explained already, and the tables will give the lunar distance with the accuracy which can be obtained from seven decimal place logarithm.

### All Other Problems Solved

All the other problems in nautical astronomy depending upon the solution of right-angled spherical triangles can be easily solved by these tables by inspection, without interpolation.

### Conclusions

When an author gives himself the real pleasure of reading old books on navigation, he finds that anything new, on this ever interesting subject, was always received and accepted by a few of the élite, until time had given its approval or it was forgotten.

Many, many years passed before the general acceptance of the Plane Traverse Tables, and even of the *Nautical Almanac*, as it is today.

Even forty-five years after the admirable invention of logarithms by Lord Napier in 1614, a distinguished mathematician, John Collins, published in London, in 1659, a wonderful little treatise on *Navigation by the Mariners Plain Scale New Plain'd* or, "A Treatise of Geometrical and Arithmetical Navigation", in which he showed how all problems could be solved by his plain scale, without using logarithms or Gunter's scales "both long and sliding."

All throughout the fifteenth, sixteenth, seventeenth, and eighteenth centuries there was a wide variety of processes for solving all problems of navigation, but inspection tables such as Wakely's, Lalande's, etc., were making their way together with the Plane Traverse Tables and the *Nautical Almanac*, towards the final adoption of inspection methods.

And now we hope a greater interest will develop among navigators leading them to use "Inspection Tables," of which we believe ours to be the safest, the "simplest and readiest" in solution and also the "most exact and the least expensive."

As Lord Kelvin said twenty-four years ago: Navigators "ought to be spared the waste of time in making calculations, which can be '*better done once for all*' by a single computer on dry land," and we hope that by using these tables they will be spared

"the waste of time" in these marvelous days of Millikan Rays, high-frequency radio and "radiovision."

APPENDIX

"I have always thought that the chief motives which ought to induce a person to appear as a writer should be, either that he has something new to publish, or that he has arranged the parts of a known subject, in a method more regular and useful than had been done before, in either of these cases he cannot be a proper judge, unless he has seen the best pieces extant on that subject. On these principles I was led to examine what had been done by the different writers on navigation and having perused most of their books, of which I could get information, I had an opportunity of discovering the steps by which this art has risen to its present perfection, and consequently of knowing the most material parts of the history of its progress".

The above words taken from the "Preface" of the third Edition of John Robertson's *Elements of Navigation*, dated Nov. 1, 1772, express the present writer's opinion and justify the program that was followed in the making of this article. The writer believes he has seen "at least, those of the most eminent authors already published".

To those, however, who wish to follow this subject more closely, the writer recommends the careful study of the works of the two leading authorities on nautical astronomy in Great Britain and in the United States: H. B. Goodwin, M.A., F.R.A.S., Formerly Examiner in Nautical Astronomy at the Royal Naval College, Greenwich, and to H. M. Board of Education and Mr. G. W. Littlehales, Hydrographic Engineer, United States Hydrographic Office.

Special attention is called to Mr. Goodwin's articles on "Great Circle Sailing" and "Spherical Traverse Tables and their Uses" in the *Nautical Magazine*, Vols. 68 and 69, London, 1900 and to Mr. Littlehales, *The Development of Great Circle Sailing*, U. S. Hydrographic Office. Second Edition, Washington, 1899, and his Patent No. 1,557,854 dated Oct. 20, 1925: "Method and means for finding geographical position in navigation". The writer wishes to express his grateful thanks to the librarians of the New York Public Library, New York City, of the Library of Congress, and of the Smithsonian Institution and of the Navy Department, Washington, D. C., and of the Franklin Institute, Philadelphia, for their many courtesies while he was making his investigations, without which this article would be very incomplete.

# *A* Study *of the* Relative Movement *of* Ships

By Rear Admiral L. M. Nulton, *U. S. Navy*

1. The mooring and maneuvering board diagram was brought into existence because of the need of some method of plotting and keeping track of the bearing and distance between ships. Its use in anchoring is simple, as for this purpose it is nothing more or less than a big compass card. The ship at anchor on which another ship is going to anchor, or moor, is simply a *fixed* point from which one is to anchor at a prescribed distance on a prescribed bearing.

2. When two ships are steaming in the presence of each other and one is ordered to take a certain prescribed position from the other, the problem becomes a very different one from that stated in the preceding paragraph. The moving ship from which the bearing and distance are to be taken (called the guide) is underway, and the problem for the second ship becomes one of obtaining a certain prescribed position relative to a moving object and holding that prescribed position while the other object (the guide) continues to move steadily on her course at her speed.

3. As these two ships proceed, they open out, (or close in), forge ahead, (or drop back), and the second ship moves with reference to the first ship on a definite line, which line gives the *relative movement* path of one ship with reference to the other.

4. In all studies of the mooring and maneuvering board, and course and speed triangles, as prescribed for the mooring board, the full significance and use of this *relative movement line* have not been properly accentuated. As a matter of fact, it is the most vital element of all, because it is the line on which you must place yourself in order to attain the position from the guide to which you have been ordered.

Only by taking into consideration the relative movement resulting from the speeds of the guide and yourself and the angle between the course of the guide and your own course, is it possible to take promptly a certain position with reference to the moving ship—the guide.

5. Suppose in Figure 1 two ships, A and B, start at the same instant from O with speeds Oa and Ob knots per hour and with courses differing by Θ°. At the end of the first hour their positions will be at a and b respectively; and at the end of the fourth hour will be at A and B, respectively. As A and B start to travel along their respective courses from O, they will start to separate along a line as ab, and this line represents their relative movement. Study of Figure 1 shows that as long as A and B maintain their initial speeds and courses, this *relative movement line* always moves parallel to itself, and its direction, as stated before, is the same so long as the speeds and difference of courses are not changed.

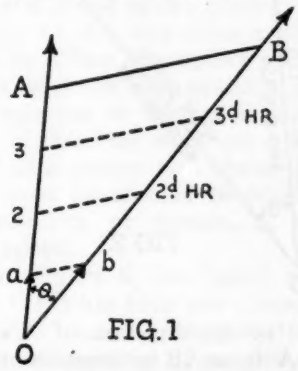


FIG. 1

The triangle OAB, Figure 2, is called the speed triangle and represents or contains the following elements:

(1) The speed of the guide.
(2) The course of the guide.
(3) The speed of own ship.
(4) The course of your own ship.
(5) The line of relative movement of the ships.

6. This triangle is the basis of all work that is done on the mooring board while underway. The relation of its sides, angles

and resulting direction of the *relative movement line* for changes in the sides and angles must be at the finger tips of the mooring board operator. Without this, it is impossible either to use the mooring board properly, rapidly and efficiently, or to intelligently understand articles, texts, or publications based upon mooring board principles.

With a complete and thorough understanding of the relations of these parts and the speed triangles as outlined above, the field in which they can be usefully and practically applied as governing the regulations of ships underway is almost infinite.

Knowing certain of these elements, it is possible to determine the others. For example: Knowing the speed of the guide and the relative movement required, it is desired to find the speed and the course of B. In Figure 2 draw OA to scale to represent A's

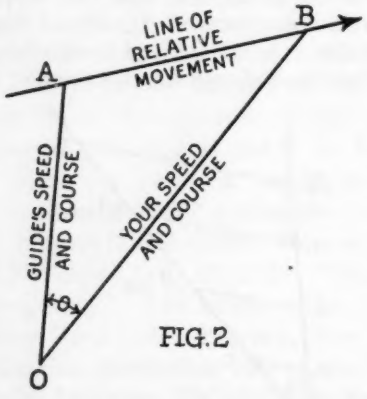



FIG. 2

speed and in the direction of A's course. Through A draw AB in direction of relative movement desired and lay off AB equal to the distance from the guide it is desired to reach in the same time that A steamed from O to A. Then draw BO. Thus on the same scale that AO equals A's speed, OB equals B's required speed, and the angle AOB thus determined gives the difference between the course steered by A and the course that B should take.

7. In Figure 3, suppose B, at the end of an interval of time, had reached a position x hundred yards from A on AB and was to maintain that position resuming A's course and speed. Then at this moment the *relative movement* of the ship would be zero, but still B would be steaming along x hundred yards from A on the bearing AB, as in Figure 3. The time it takes B to reach this position will depend not only upon the distance of the new position from A, but B's relative rate of speed along AB. The method of calculating this time will be given later on.

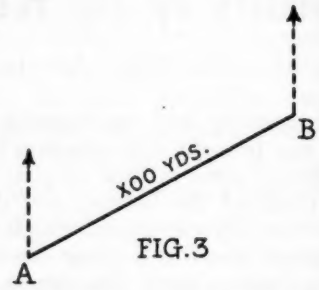



FIG. 3

A study of Figure 4 will show the rate of separation, i.e., the speed of relative movement, along AB may be varied by changing B's course and speed. For example, if B takes either speeds O4, O5, or O6, with their corresponding courses O4, O5, O6, the relative movement along AB will be the same as to direction, but it will take different times on each course to reach B at a prescribed distance and bearing from A.

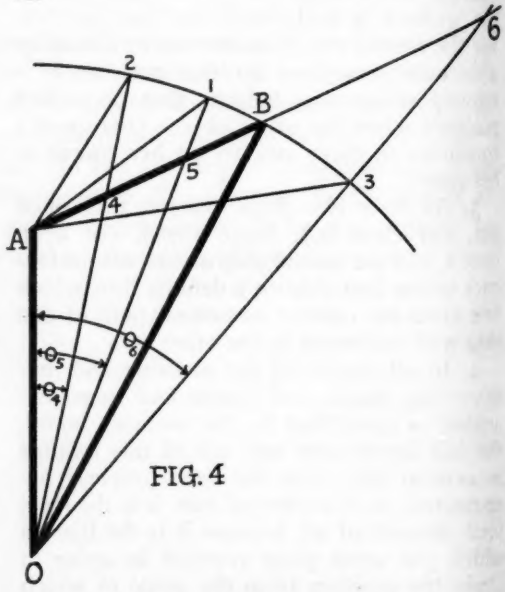



FIG. 4

As a matter of similar interest if B maintains a constant speed, but steers any one of the courses O2, O1, or O3 at this speed, the relative movement will correspondingly be along the lines A2, A1 or A3.

8. In Figure 5, suppose that with given speeds and courses, A and B have left O at

the same instant, B having orders to take station Φ° on A's bow and distant y hundred yards. Plotting the speed triangle OAB, the relative movement is on AB inclined Φ° to A's course.

At the end of a certain interval of time A will have moved from O to A, and B from O to B, and they will be distant AB yards. At a later interval A will have arrived at a and B at b, still on the same relative bearing but distant from A x hundred yards. Finally A will arrive at $a_2$ and B at $b_2$ on the proper relative bearing, and at the required distance of y hundred yards. At this point B takes A's course and speed to maintain station. In reaching this position B would have steamed a distance $Ob_2$. The time required to get in the new position would be the distance steamed by each ship divided by its speed. A much simpler procedure for ascertaining how long it would take B to reach a given station will be given later on in paragraph 17.

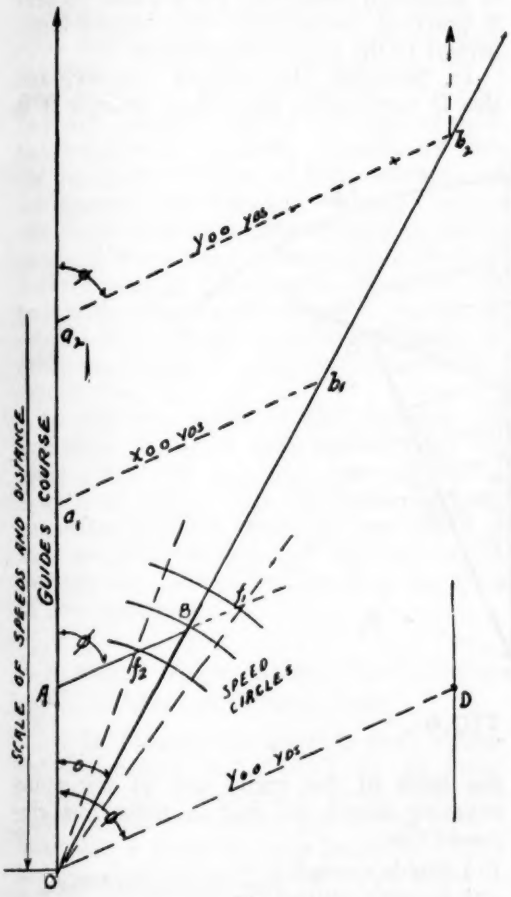



FIG. 5

9. For the particular problem given we could have found B's course as follows: Lay off OA=speed of guide. Plot O and D as the present and new position of B. Through A draw AB parallel to OD. With O as a center and a radius OB=B's speed strike an arc cutting AB at B. Join BO. The required course for the speed OB is Θ=AOB. Had it been desired to use other speeds for B, arcs with radii $Of_2$ or $Of_1$, corresponding to these speeds would cut AB at $f_2$ and $f_1$, respectively, giving corresponding courses $AOf_2$ and $AOf_1$. In both cases the direction of the *relative movement* would be the same, i.e., along AB. With speed $Of_2$, however, B would take longer to arrive in position, and in the other case less time, than if speed OB had been used. *Study* the Figure.

Hence the mooring board rule: **Lay off from the center a line representing the course and speed of the guide. From the extremity of this line draw a second line parallel to a line connecting your present position with the new position you are to attain, relative to the guide. The intersection of this line with any speed circle with O as a center will show the course which must be steered to reach the desired position, or station, at that particular speed.**

10. In Figure 6, the speed and course triangle OAB has been reproduced. It will become at once apparent that for convenience and accuracy of solution of various triangles, a series of concentric speed circles can be drawn on which any speed in use can be laid down and rapidly measured either for the guide or for your own ship. It will also suggest itself that facility in determining compass course will be increased by adding a protractor or compass rose circle, such as COC, on the outer edge of the diagram—hence the mooring board diagram. (See Fig. 8).

In Figure 6, from what has already been explained, the triangle on the right hand side of the circle will give the direction of the relative movement of any ship in relation to the guide when going from O to the position $B_2$; or from $B_3$ to O; or from $B_3$ to $B_2$, when such ship uses the course-angle Θ and the speed OB.

Similarly, the speed triangle OAB, on the left hand side of the circle (Figure 6), shows the ***relative movement line*** of a ship going from $B_2$ to $B_3$, or from O to $B_3$, relative to the guide.

A change of your course, or a change of your speed, or a change of both your course and speed, all relative to the guide, will produce changes in the direction and length of the sides and angles of this triangle, and for the same base line OA (which is the speed of the guide and which in this study is maintained constant, whatever its value may be in knots per hour) will produce innumerable variations in the slope of the relative bearing line and the courses and speeds which may be combined to attain a required position.

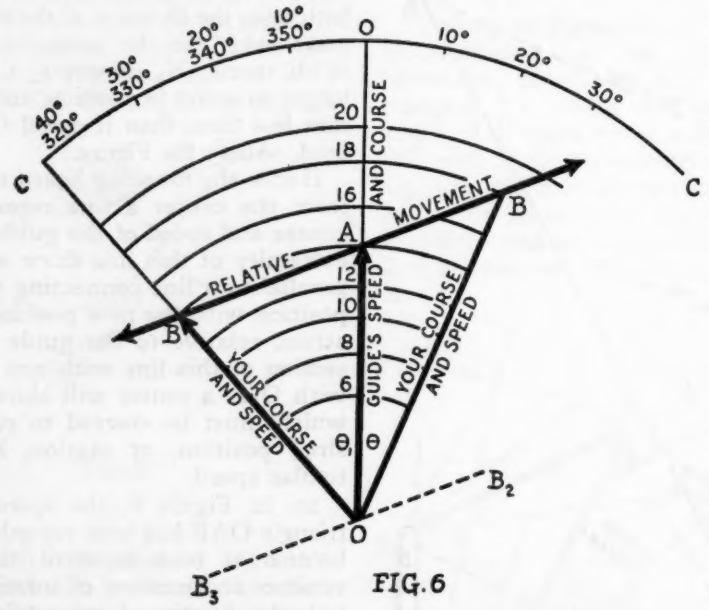



FIG. 6

Repeating, this speed triangle contains:

(1) The guide's speed laid down on any arbitrarily assumed scale.
(2) The guide's course.
(3) Your own speed measured on the same scale as that on which the guide's speed is measured.
(4) Your own course relative to the guide's course.
(5) The line of relative movement of your ship to or from the guide.

Attention is called to the fact that items 1 and 2 above are always fixed by the problem in each and every case, for the simple reason that if you do not know the guide's speed and the guide's course, you cannot accurately maneuver on her; and, if the guide does not maintain a steady speed on her course, you cannot accurately maneuver on her. In the former condition, you would have two entirely unknown quantities; in the latter condition, you would have two entirely fluctuating quantities. Neither of these sets of unknown conditions for a guide renders it practical for another ship to coordinate herself to the guide's movements.

11. Studying the triangle further, and this is particularly important, because it is the basis of the entire use of the maneuvering board, we find in these five elements that:

(1) Guide's speed
(2) Guide's course } are known and fixed.
(3) Your speed
(4) Your course } may each be varied, but of these three items you must assume two to produce the third one,
(5) Line of relative movement

or, to put it another way:

(1) and (2) are fixed by the problem in all cases.

Any combination of an assumed (3) and (4) will produce a resulting (5).

Any combination of an assumed (4) and (5) will produce a resulting (3).

Any combination of an assumed (3) and (5) will produce a resulting (4).

The resultant in each case being that of the particular set of conditions assumed.

12. It is the ability to understand these combinations and to mentally picture them rapidly which will enable you to use the mooring board successfully. Practically every maneuver is governed or guided or a position obtained by having two of these elements given and assuming two others in such combination that the resultant fifth element (a relative movement line, or a new course, or a speed, as the case may be) will put your ship in the required position relative to the guide. Familiarity with the rapid combination of these elements on the maneuvering board is necessary before the board can be used successfully, and a thorough knowledge of the relations of these various parts of this triangle will enable you to rapidly select combinations at your command which will give you not only practical information, but, if properly used, the best information.

In the first study of this diagram the two ships A and B were started from the same point, but this was done only as a matter of convenience in developing the principles involved which are applicable to any original positions of the two ships whether together or separated at the start of the maneuver.

## A Further Study of the Principles of Relative Movement

13. In Figure 7 the guide is at O, steaming on course 20° (true) at 12 knots speed. P is a ship 2,000 yards from the guide on line of bearing 40° on the guide's bow (i.e., P bears 60° true from O). They are steaming steadily along at 12 knots in this position. In this situation the relative movement of P with reference to O is zero. Assume now that P changes courses 60° to the right of the guide's course (to course 80° true) and maintains her original speed of 12 knots. Constructing the speed triangle OAB we see that as soon as P turns, a relative movement with reference to O will take place and P will begin to travel along the line Pa, successive plotted positions relative to the guide being shown at 1, 2, 3, 4, etc., on the line Pa. As long as P holds this course-angle of 60° relative to the guide's course, she will continue to travel on the line Pa, and will reach some indefinite position along that line depending upon how long she holds her course and speed. The direction of the line Pa from P is determined from the speed triangle as generally explained in Figure 6, and as applied to the specific problem in Figure 7. By the selection of combinations of speed and course-angle as referred to in paragraph 11, it is apparent that we can go out from P on a predetermined line (in other words, control the direction of Pa from P if we select the proper combination of elements as referred to in paragraph 11).

14. Suppose "b" a ship at any position with reference to the guide, steaming the same course at the same speed of the guide. Suppose "b", using standard speed, changes course 30° to the left of the guide's course, in this case to course 350°, (true) the construction of the speed trangle $OAB_1$ will show that for these conditions the relative movement line of "b" with reference to the guide O will plot at positions 6, 7, 8 and 9 on the line "bd". If "b" holds her course of 30° to the left of the guide's course and continues to steam at standard speed, she will eventually arrive at some position $P_1$ on the line "bd." Suppose the position $P_1$ is a new position that you are ordered to take with reference to the guide. It is apparent from the study of the speed triangles that **we can reach the position $P_1$ on a predetermined line** by the assumption of the proper elements as noted above in paragraph 11.

A very important principle is established right here with reference to the study of these two movements. The study with reference to the point P has developed the fact that we can move out from the position P on any predetermined line of relative movement by selecting the proper combination of elements with reference to the guide.

The study of the movement from b to $P_1$ has brought out the fact that we can approach any given position on a predetermined line by selecting the proper elements in accordance with the principles of paragraph 11.

If P, while traveling along Pa, has decided that she wanted to go to the position $P_1$ on a course 30° relative to the guide, all that would be necessary for her to do would be to construct through $P_1$ the relative move-

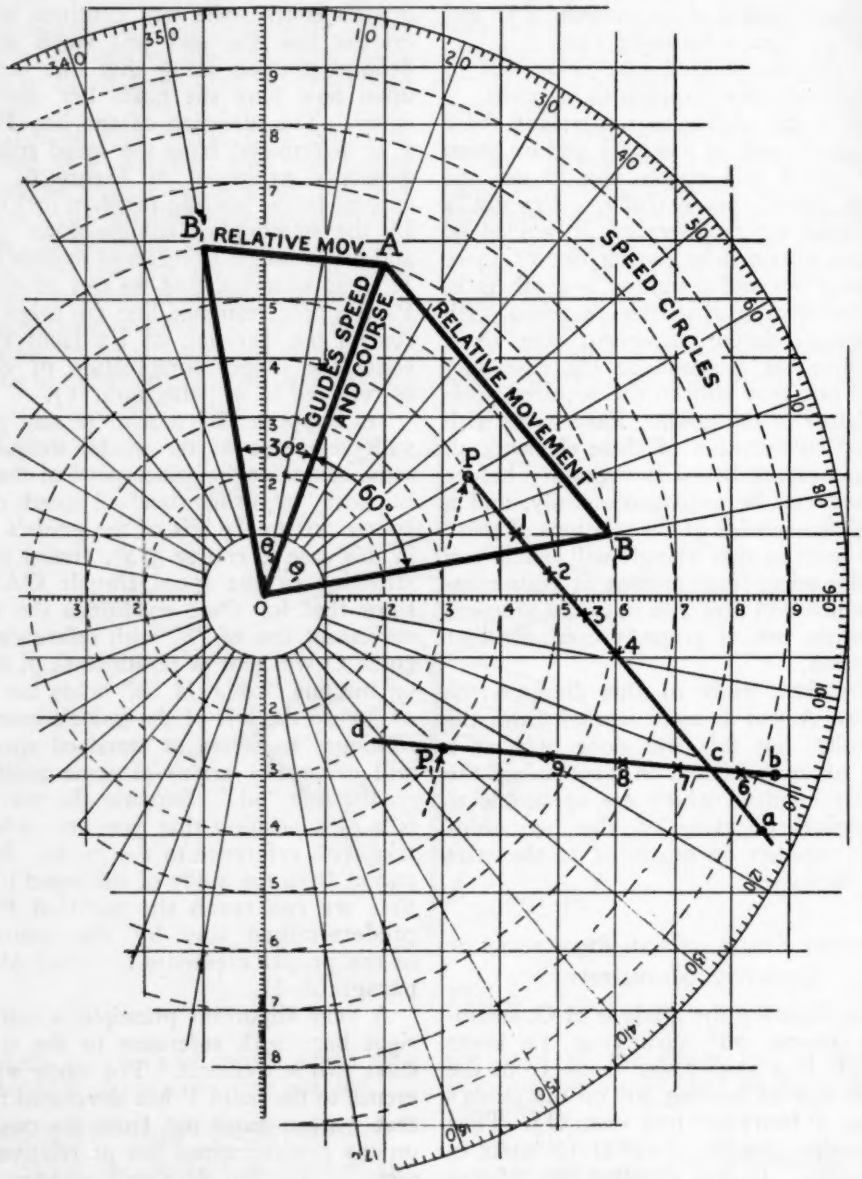



FIG. 7

ment line $P_1b$ for the 30° course, and where Pa crossed $P_1b$ at c, change course 30° to the left of the base course, finally arriving at $P_1$.

15. The studies preceding this are merely the analysis of the various phases of dropping back from a position P, 40° on the bow of the guide to another position $P_1$, 40° abaft the beam of the guide. A slight study of the figure will make it self-evident that in order to go directly from P to $P_1$, P would have to change course through something over 180°, a condition which is undesirable and impractical in changing line of bearing in the fleet. Instead of making, therefore, the violent movement between P and $P_1$, it is broken up into two movements of a first change from base course away from the guide, and another change from base course toward the guide. Such a man-

euver is termed a "two-course maneuver" and is the basis on which the two-course angle card is developed.

16. The foregoing are merely my own personal notes on this subject.

Summarized, the ship at P can, within reasonable limits, select any course she pleases to go out on, and can select a predetermined line to come back on. The time to change back through the base course to the second course is given at the intermediate position "c", and this intermediate position is determined by the intersection of the relative movement lines Pa and $P_1b$.

17. The particular study of Figure 7 is based on a dropping back problem in which the ship dropping back maintains standard speed. Any speed could be selected to go out on or come back on, and the lines Pa and $P_1b$ adjusted accordingly from the speed triangles constructed with the data selected.

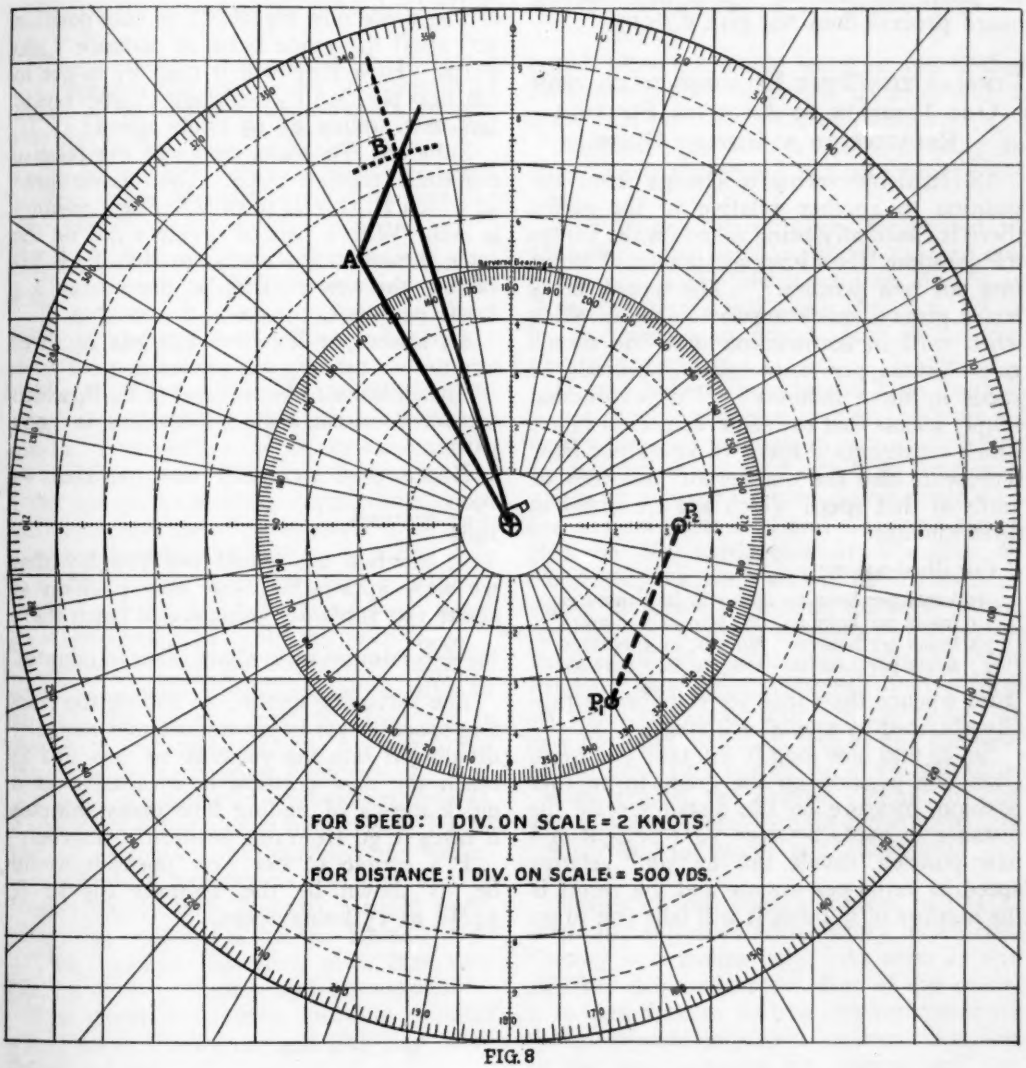



FIG. 8

The principle of approaching such a position as $P_1$ on a predetermined line, that is, with a predetermined course relative to the guide's course, is very useful and important, as is also the significance and meaning of the intermediate position "c".

Figure 7 contains the principles on which

the course-angle cards are constructed, and what is more important, gives a mooring board process for determining a two-course maneuver to drop back in case course-angle cards are not available. The course-angle cards have the advantage of having the time required to perform the maneuver etched on them, an element which the mooring board process does not give directly.

### FINDING THE TIME REQUIRED TO GO FROM ONE POSITION TO ANOTHER POSITION RELATIVE TO A MOVING GUIDE

18. In maneuvering to change from one position to another relative to the guide, there is *constantly* being asked on the bridge the question "How long will it take us to get into our new position?" The maneuvering board gives a quick answer to the question when used in conjunction with the thumb rule—"knots per hour equals hundreds of yards in three minutes." This expression simply means that the same numerical figure which represents a speed in knots per hour represents also the number of hundreds of yards at that speed which are traversed in three minutes.

For illustration:

15 knots per hour = 1500 yds. in 3 minutes.
9 knots per hour = 900 yds. in 3 minutes.
7.5 knots per hour = 750 yds. in 3 minutes.
2.7 knots per hour = 270 yds. in 3 minutes.

from whence the yards per minute are rapidly obtained by mental arithmetic.

So, to find how long it will take you to go from one position on the guide to another position, measure on the distance scale the distance in yards between your present and new position, divide this by your *relative* speed in yards per minute and the result is the number of minutes it will take you to go from your present position to your new position relative to the guide.

For example, in Figure 8, let one division on the scale represent 500 yards for distance and two knots for speed. Let the guide O and the ship $P_1$ be steaming in column at 12 knots on course 330, $P_1$ being 2,000 yards astern of the guide.

The guide now signals $P_1$ to take position 30° abaft the guide beam at distance 1,700 yards. How long will it take $P_1$ to get to her new position $P_2$ assuming $P_1$ goes out to her new station at 15 knots speed?

Solution: To scale, complete the relative movement triangle OAB. The relative speed at which $P_1$ travels toward her new position is AB. With a pair of dividers AB on the scale measures 4.4 knots, so that $P_1$ is attaining the new position at the rate of 4.4 knots per hour.

4.4 knots per hour = 440 yds in three minutes = 146 2/3 yds per minute.

The distance to be traveled is $P_1$ $P_2$ which measured on the scale by dividers is 1,900 yards.

Hence time to reach new position = $\frac{1900}{146\frac{2}{3}}$ minutes.

In practice we would say roughly that we were approaching our new position at about 150 yards per minute and reach there in $\frac{1900}{150}$ minutes or in about thirteen minutes.

The foregoing method of finding the relative speed in yards per minute and mentally dividing it into the yards to be travelled to reach the new position is invaluable as a quick means of finding how many minutes it takes to go from one position to another.

$P_1$'s course to her new position would be, as shown by the diagram Figure 8, 342½° at 15 knots speed.

# Discussion *of* Limitation *of* Armaments

*By* Rear Admiral (Retired) W. L. Rodgers, *U. S. Navy*

[Editor's Note—These remarks, while originally prepared last summer for the Institute of Politics at Williamstown, Massachusetts, are considered of such merit by the Board of Control as to warrant their publication in the Proceedings, despite the fact that they were given considerable publicity by the Associated Press at the time they were made.]

THE Washington Conference is past and gone but its consequences remain with us for better, for worse. It runs till 1936 and we should know what it has done for us.

I was asked to speak on the Washington Conference for the Limitation of Armaments. I served on the citizen's committee of advisors to the American delegation, but I did not get as much understanding of the question from this duty as might have been expected because the delegation relied only to a small extent on its advisory committee. What I am about to say, therefore, is based on a comparison of public documents.

The agenda of the conference included naval armaments, land armaments, rules of warfare for the new methods developed in the recent war, and questions relating to the Pacific and Far Eastern countries.

As for the question of land armaments, it was disposed of almost immediately by the French delegation who declined any limitation of their armaments as long as the United States and England refused guarantees for security along the Rhine.

The Japanese indicated, also, that they did not care to discuss land armaments.

The naval armaments and the political questions in the Pacific and Far East were closely related.

As the Navy is thus tied up with politics, I think it desirable to explain what function navies perform in the national life. The first, and almost the only duty of navies in all times, in all countries, is to protect commerce. The Athenian Empire grew on its navy, which protected the commerce of the eastern Mediterranean, and the profits secured from commerce were so much that Athens not only supported its navy but it grew rich on the profits of commerce.

Similarly the British Empire today is based on its supremacy in ocean transportation.

The United States Navy originated in 1794, when the Barbary pirates attacked our commerce in the Mediterranean, and it is alleged that they were encouraged to do so by England, who found our commercial rivalry disturbing.

It may be well here to dwell on the importance of commerce in war, because an enemy may be overcome in two ways, either by bloodshed or by loss of its economic means of support. In the recent great war, for example, England and Germany struggled on the battlefields of Flanders by bloodshed, but they also struggled each to starve the other by cutting off ocean-borne commerce. Germany succeeded in annoying England by the submarine warfare, but England was entirely successful in cutting off the ocean-borne traffic to Germany. It may be noted, however, that during the time of our neutrality one of the American complaints against the English conduct of the war was that Great Britain interrupted our traffic with Germany and substituted her own.

Navies do not engage in fleet battles as is usually supposed with victory as an end. Victory is a means only. As soon as one side has disposed of the fleet of the other, it is then free to destroy the commerce of the enemy and to protect its own. As long as the two fleets do not engage, and are fairly equal, the commerce of each is in doubt.

Ocean-borne commerce is one of the chief means of civilization and progress in the world. From the beginning of time the exchange of products has brought knowledge as well as freight. At the present time, with the great specialization of industries the

products of the world go to all parts of the world. Some countries, as we have heard in the chemical discussions, have products which are necessary to all. The control of shipping enables a nation which possesses it to direct the traffic of the world to its own advantage. As we know in business, it is the middle man who gets rich. The banker stands between borrower and lender and gets rich. The lawyer stands between two litigants and gets rich. The railways which, until the interstate commerce law in this country, stood between the producer and the consumer, grew rich. And so the control of ocean transportation by any one nation puts it in the middleman's position to grow rich by controlling the traffic between producer and consumer.

As an example, in 1919 the price of steam coal f.o.b. at Cardiff was about twice the price of similar coal f.o.b. in Hampton Roads. Brazil wanted coal, but the situation of ocean traffic was such that British ships took the high-priced Cardiff coal to Brazil, in the interests of British business.

Cables also were a great aid in controlling business. A few years ago our Secretary of State informed the Foreign Office in London that there was reason to believe that American business despatches over English cables were manipulated to help British business. Lord Curzon replied, saying in substance that such a thing appeared unthinkable, and asked for evidence. When the State Department asked the complainants to step forward, they said that their business was already crippled and if they should appear as witnesses it would be ruined. So the State Department was obliged to drop the matter. I have seen similar consular reports as to the control of news in the Far East.

In order to discuss the question of limitation of armaments we must understand the British trade policy. During the nineteenth century Great Britain had developed a supremacy in the business of the world through her coal and iron manufactures and delivery by British shipping. By 1900 Germany and the United States were passing her in coal and iron, as well as in manufactures. The close of the war found her, in comparison with the United States, inferior in manufactures and in coal and iron. The war had developed a great merchant fleet in the United States, whereas the English merchant fleet, though superior to that of the United States, was much reduced by submarine losses. There was no appearance that the British Empire, with 45,000,000 inhabitants, could rival the United States, with 100,000,000, in industrial output. A new policy to maintain as far as possible, her place in the world, was necessary. She seems to have decided to develop her position as traffic master of the world.

She established a ministry of fuel after the war. She made a combination with the Dutch oil interests. She developed her own oil in Mesopotamia. She wanted to use her fuel stations throughout the world, and by the control of shipping to hold as much of a predominance in the world as was possible. This position would be impaired were the United States to have a great merchant fleet.

In 1919, on the close of the war, Great Britain seems to have resolved that she must cut expenditures, and while doing so do all that she could to preserve peace in the world while she was recuperating her finances. But at the close of the war, not only was there a big American merchant fleet but there was a big navy as well to protect that merchant fleet.

The prosperity of the United States depends on its continued export of about ten per cent of its products. As we have heard from the chemical lecturers, we must have products of one sort or another from all corners of the earth. In order to keep that prosperity in peace and in war, even when we are neutral in war, we must be able to rely on our own merchant fleet in all times, because when war comes, the belligerent nation will require all its shipping and more as well, for its own service, and if we rely on another nation to provide our shipping service, if that nation goes to war the prosperity of the United States will be far more affected than if we have our own means of transporting our products to the four corners of the earth.

As I have said, the Navy at the close of the war was in keeping with the size of the new merchant fleet. Not only did we have a great Navy, but the Army was also large. President Wilson wanted an army of 500,000 men, and although General Pershing and the general staff told him that half of that would be amply large for a nucleus upon

which to develop an armed strength in time of war, nevertheless, he did not heed them. While England had laid down no new battleships since the beginning of the war, the United States had sixteen great ones which it had started, and it was alleged that Mr. Wilson's belief was that he would be the virtual head of the League of Nations, and the Army and Navy of the United States would be his instrument with which to compel the world to peace.

Great Britain was probably little interested in the size of our Army, but was much interested in the merchant service and Navy, both of which it was important to the Empire to see reduced. Accordingly, in the spring of 1920, the First Lord of the Admiralty announced as a national policy that it would be content with a one-power navy. The meaning of this conference was that in answer to Germany's growing naval power it had been the policy of Great Britain to maintain what it called a two-power navy, that is to say, content to build equal to the combined navies of the two greatest naval powers. Now the German Navy was destroyed, and the American Navy was far outbuilding the British.

This announcement from the British Government in March, 1920, brought no reply from Mr. Wilson. In the fall of 1920, when Parliament met, the First Lord of the Admiralty went a step further. He announced that they hoped to get a call for the limitation of armaments from the United States. The Democratic party was still in power, and it can scarcely be believed that they had already interviewed the Republican candidate. However that may be, the press of the country began to call out for limitation of naval armament in the interest of peace and the reduction of expense, and in the winter of 1921, while the Democrats were still in office, the Naval Secret Service, which was still serving, because peace had not yet been declared with Germany, called the attention of the Navy Department to British propaganda in the United States for the reduction of armaments. However, as the Democrats were just going out of power, they were perfectly willing to leave the settlement of the control of public opinion in the United States to be settled by the incoming Republicans.

In regard to foreign propaganda in this country you may recollect that Mr. Harding found it necessary to protest publicly against foreign lobbies at the capital influencing national policies. He was referring to his shipping policy of a subsidy, which foreigners disliked.

Whatever you may believe about the origin of the cry for reduction of naval armaments, it took on well in the country, and decided Mr. Hughes to call a conference to effect that purpose. In the summer of 1921 a conference of colonial prime ministers was called in London, and before it adjourned Mr. Harding sent the President of Columbia University, Nicholas Murray Butler, to sound out the British Government on the subject.

Lloyd George said that the bases of armaments were political conditions, and that he could not think of agreeing to disarmament unless the political difficulties were first settled, but he accepted the idea of the discussion of both.

Accordingly, early in August, Mr. Hughes issued a call for a conference to meet in Washington on November 11 following. Now, as the question of disarmament, according to Mr. Lloyd George, depended on the political situation in the Far East, we must see how that stood.

The matter of greatest importance in the Far East was the control of trade with China. There was a nation of 300,000,000 or 400,000,000 people with which all the nations of the world were anxious to trade. At one time it had been divided into what were called "spheres of influence," that is to say, the English claimed the predominance of trade in one part, the French in another, the Japanese in another. The United States did not stake out any sphere of interest.

In 1899 Mr. Hay got the powers to consent to what he called the principle of the "open door." That is to say, they agreed not to take undue advantage of each other in trade.

Ever since their success in the war with China in 1894-95, the Japanese have had before them the economic and political idea of developing their trade relations with China until they should predominate over the rest of the world, and the other nations which wanted to retain a hold therein. As a result of Russia's seizing the peninsula of Liao-Yang, Russia had established herself securely with a base on the Pacific. About this time there was a party in Russia which

suggested an agreement with Germany so that Germany should have a free hand in Southeastern Europe, and Russia was free to develop in Asia. At the same time England was threatened by Germany's decision to increase her navy, which threatened England's supremacy in trade. At this time England announced her two-power standard.

As I have said, Japan was anxious for predominance in China. Now, as Russia threatened both English and Japanese interests there it was possible for the two countries to make their treaty of 1902 for their mutual assistance. It guaranteed each in her position. It left England unembarrassed by eastern questions to face Germany, and it secured English support for Japan. At the same time, while it made Japan supreme in Asia it also permitted Germany a much favored position in European affairs. In the war with Russia which began in 1904, the alliance carried Japan through the war with success. England also secured about the same time her *entente cordiale* with France. The treaty of 1902 guaranteed the independence of Korea. The treaty had to be amended in 1905 to suit the new position of Japan, because England could not yet forego the Japanese alliance, but in this amendment the English went further than they had done in the first treaty.

The first treaty said that either party was to come to the support of the other were it attacked by a third power. The new treaty of 1905 said that in case of any aggression the other party to the alliance was to come in. This was a further guarantee of Japan's position in the Far East. But this treaty of 1905 ran for ten years. It had to be revised again to suit the new conditions in 1911, because the year before Japan had annexed Korea, which was not provided for in the treaty. England still needed an alliance in the face of the European situation. However, the English situation had been considerably ameliorated in 1907 by an agreement with Russia securing central Asian affairs and the position of the two countries in Persia and Afghanistan, but the United States was standing still for the "open door" in the Far East, which made some friction with Japan, under the terms of Mr. Hay's convention made at the time of the Boxer trouble. But though the European situation pledged England to ally herself with Japan, she had no wish to fight the United States if the latter should oppose Japan, so England agreed to the arbitration treaty made in Mr. Taft's administration, in which the arbitration court would settle the disputes. Consequently, the Japanese treaty was modified to take account of this arbitration treaty and excused England from going to war with the United States if the latter should quarrel with Japan. But the Senate refused the arbitration treaty, although in the meantime England had signed the modified Japanese Treaty, so that technically, in the failure of the arbitration treaty, England was still bound, as an ally of Japan, to go to war with the United States, so England fell back on a technical phrase in the form of the Treaty of 1914 with the United States, in order to call that an arbitration treaty.

Thus the great war came on. The English alliance afforded an excuse to Japan to take over the German possessions in Shantung, and also allowed Japan to make great advances in China, Siberia, and Manchuria.

The United States stood for the "open door," so after the war, when Mr. Hughes issued the call for a conference on naval reduction, the Japanese and English treaty was the chief political thing, although the latter did not appear on the agenda. The English propaganda in this country to insist on economy and to do away with armaments to prevent war was so successful that that question outshadowed the political relations which armaments defend. As I see it, the conference was called because Great Britain objected to the United States having a merchant fleet and a navy bigger than her own. She held up as a bait the idea of settlements in the Far East as an objective, together with the abrogation of the Japanese alliance. As for this, it is rumored that the colonial premiers had refused to permit its continuance, although it was extended temporarily, and in this way the four-power treaty of Washington enabled Great Britain to save her face, as by its ratification the English-Japanese Alliance was automatically terminated. This position of the colonial premiers is attributed positively to the Canadian Prime Minister in the July *Edinburgh Review.*

The Japanese would not agree merely to the naval settlement and the cancellation of the English treaty, for that might have allowed England and the United States to coerce Japan about China. And so the four-power treaty pledged the four powers—England, France, the United States, and Japan

to hold a conference whenever the rights of one of them in the Pacific questions were challenged. It is not unlike the principle of Locarno. It is a guarantee of the *status quo*, and terminates the Japanese treaty. It is a pledge of non-intervention and perhaps limits the freedom of the United States and England to put pressure on Japan. I have no doubt that if war came between Japan and Russia, Japan would ask aid of the three signatories of the treaty, although the phrase is vague and might be interpreted otherwise and refused.

We are now able to turn to the naval situation. In the summer of 1921 America was building a great fleet of battleships and battle cruisers. England was building next to nothing. Japan was building to some extent and had a very large paper program which would be a great financial burden to carry out in full. She was already beginning to feel the fall from the period of prosperity at the end of the war.

The English were willing to permit a one-power navy. The Japanese wanted a cut for financial reasons if they could make additional conditions satisfactory to themselves. A limitation of navies could have been made on several different levels. It might be made on the high level of ship building authorized by the United States and Japan, or it might have been made on the low level of England's non-construction.

The proposing power is at a disadvantage always in such cases. Having initiated the conference at the earnest desire of England, as announced a year before, the Republican party needed an international success to put against the Democratic failure with the League of Nations. For the Republican party to make a failure of this international conference would be a severe blow in home politics. When Mr. Hughes arose to make his opening address, except for the delegation, the technical naval committee, and two clerks, no one knew what the proposal would be. The Navy Department had considered on what the limitation might be based. The budget was rejected because it was too easy to camouflage, as well as because expenses are very different in different countries. The number of men also seemed unsatisfactory on account of the financial differences in wages, and on the management of reserves, which would be very hard to settle, so the displacement of ships was decided on in the belief that displacement was the element least capable of juggling. It was not difficult to arrive at the 5-5-3 ratio, as was proposed by Mr. Hughes, but some *status quo* was necessary to select upon which to apply the ratio. The English, American, Japanese fleets and ship building status each formed a foundation from one of which it was easy to pass to the other.

When Mr. Hughes read his list of ships to be scrapped it was apparent that the English had been successful in establishing the one-power standard which they had announced eighteen months before, in order to limit the sea power of the United States and to prevent America from becoming her rival. Although Mr. Hughes denied having agreed with the English beforehand, and this denial must be accepted as absolute, it was understood in Washington that the British Ambassador was in frequent conference with him and Mr. Hughes must have known that his proposal would be thoroughly acceptable as to battleships.

But the Hughes proposal included other classes of ships, and limited them in the same ratio. So, while the British welcomed the sacrifice of over 800,000 tons of American shipping which they had come to receive, they had no wish to limit themselves in other classes which they regarded as vital to their supremacy on the seas. So that rejecting the limitation in auxiliary ships and in cruisers, they accepted an amendment to the original proposal which limited the size of cruisers to 10,000 tons and limited their armament to 8-inch guns. So far from terminating the rivalry between the United States and England in naval ship building, it wiped out the standing American superiority and allowed the British to develop at will in a smaller, cheaper class of ship more suited to their finances.

I may mention here that a further limitation of naval armament would be more advantageous to Great Britain than to ourselves, because in time of war the merchant fleet must be protected. If the specialized ships built for the protection of merchant fleets and called a navy are reduced, it will be necessary in a greater degree on the outbreak of war to convert a certain proportion of merchantmen into ships of war in order that they may protect the rest. Thus, Great Britain with the biggest merchant service could afford to see all navies abolished better than any other nation.

The Japanese position in regard to the limitation of armaments was that her policy in Asia and her predominance over the economic affairs in China, Manchuria, and Korea must be maintained. She first argued for a 10-10-7 ratio of ships instead of the 10-10-6 which was the one actually proposed and accepted. However, in the course of discussion after putting this forward she sacrificed it for the demand that there should be no increase in fortifications of the United States west of Hawaii, and no increase of British fortifications east of Singapore. This position in regard to fortifications had been freely announced in the Japanese newspapers long before its delegation started for the United States, but when Mr. Hughes made his proposal he made it complete, with no negotiable points in reservation. Consequently, if he were to sign a treaty at all he had to meet the objections of all comers upon his original proposal. Therefore the Japanese requirements had to be accepted. This gave her great security for her policies in China, because it quite destroyed the effect of Mr. Hughes' proposed ratio of 5-5-3 since the Japanese home situations and fortifications naturally were not affected.

Mr. Hughes' proposal included the limitation of submarines, on which proposal there was a marked difference between the English position and the French. The French desired a larger submarine armament than the number assigned in Mr. Hughes' proposal. The British desired the entire abolishment of submarines. They made a very strong plea on the ground of the inhumanity of submarines, but their real reason was that the French position on submarines challenged their supremacy on the sea, and the French were unwilling to give up submarines because they intended by that means to have some hold and threat on their good friend and ally. Consequently the submarines were untouched.

As I understand the Italian position, I do not think they cared a great deal about what was decided on so long as they were fully equal to France, their rivals in the Mediterranean.

Another subject in the agenda was the rules of warfare with new weapons. On this subject Mr. Root proposed a treaty rejecting the use of poison gas, and forbidding the use of submarines against commerce. My own opinion is that these treaties are not very likely to be observed. Their animating motive was emotional. In war time men accept the fact that people must be killed, but they resent violently the idea of being killed by new methods. When the Germans first used poison gas, the Allies cried out about it as inhuman and scandalous because they had no reply to it. But after the temporary advantage gained by the surprise, the history of the use of gas was the same as that of all other new weapons. As soon as the Allies found out how to deal with it, they developed their poison gas resources and the defense against it by masks, and went to it with greater vim than the Germans.

The medical profession says the effect of poison gas is to produce pneumonia. We do not make any great outcry about natural deaths by pneumonia, and it seems to me that death by pneumonia in war is no worse than any other form of death. Throughout the war, although the Allies were using it most vigorously they cried out against it as inhuman because they thought it a good way to work up public sentiment at home to fight harder against the Germans, but they were far from rejecting it. They did not confine themselves to the use of gas masks.

As to the submarines, I think this part of the treaty is also emotional. The treaty states that as it is apparent that submarines cannot be used against the merchant service without violating the established principles of war, they must not be so used, but as a matter of fact this preamble does not correctly state facts. A submarine can probably accommodate nearly as many men and prisoners in her interior as a torpedo boat of the same size. A torpedo boat could not have removed the crew and the passengers of the *Lusitania* before sinking her any more than it could have been done by the submarine which actually sank the *Lusitania*. If submarines are instructed to proceed in accordance with the laws of war as they now exist, they will be able to do so without any more difficulties than other classes of ships.

There was also a resolution passed that a conference should be called to consider other new weapons in warfare, and this convention met a year later at The Hague. The only things submitted to it were aviation and radio, as the other two matters were forbidden by the terms of the resolution. Although the rules then formulated have not been accepted by any power, I think it likely

that they will serve as the basis of the rules for aviation and radio in the next war, but at present, in times of peace no nation likes to commit itself to rules until it sees what its own position will be—whether it will profit by them or not, according as it is a belligerent or a neutral in the next war.

The basis of the agreement about aviation was substantially that air machines are not weapons but vehicles, and that whatever is proper for a belligerent to effect against his adversary when he is in another vehicle, it is proper for him to accomplish when he is riding in the air. If, under certain circumstances, it is proper to bombard a city by artillery on the ground, under those same conditions it would be proper to bombard it from the air. If under other circumstances it is improper to bombard a city from artillery on the ground, it is improper, under those same circumstances, to bombard it from the air.

The agreement on radio involved the use of radio as a belligerent instrument, and guaranteed a certain measure of control over the use of radio by neutrals.

To summarize, we find that the political treaty, the four-power treaty, did away with the English-Japanese alliance, and substituted therefor an agreement of non-intervention by England, the United States, France and Japan. The conference also established a *status quo* giving to the Japanese a considerable advantage in the limitation of fortifications, giving Japan a double security. The Japanese supremacy, however, in continental Asia is considerably limited by her situation in the face of Russia. Moreover, the Japanese realize very strongly the effectiveness of the Chinese boycott. They want to control trade in China, and if they put too much pressure on, the boycott blocks them, and they are not free, under the four-power treaty, to alter the *status quo* without consultation with France, England, and the United States, which have their own interests to protect.

Many other things were urged at the conference. The Chinese were extremely anxious to put the Japanese out of Shantung, but the American delegation did not seriously press this point until the Senate intervened with a resolution, and it seemed that if the treaty were to get through the Senate something would have to be done about Shantung, so by yielding on this point and consenting to evacuate there, Japan was able to avoid all reference to Manchuria, and make herself more secure there.

So that the whole result of the conference was that for the advantage of Great Britain the treaty destroyed the threatened American supremacy on the seas and left Great Britain as the leading sea power in merchant fleet and in war fleet, for she is developing her cruiser class which the treaty left unlimited. Further, it released her from the Japanese alliance which Canada would no longer tolerate. With the limitation of armaments the United States consented to the four-power treaty by which Japan is made secure in her *status quo* on the continent of Asia until Russia offers an objection, or China herself becomes strong enough to do so. The United States made all the sacrifices by which the *status quo* is secured.

NOTE: It is the Four-Power Treaty by which the United States is now restraining the other powers from taking aggressive action in China.

# Submarines *and* Disarmament Conferences

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## INTRODUCTION

ONE thing stands out clearly from the proceedings at Geneva. In the naval sub-committee of the preparatory commission of the Disarmament Conference, France has made clear that she remains steadfast in one conviction. She believes that unlimited submarine tonnage is essential to her security. And in that attitude France has been seconded by Ialy.

It is of course an old story that at the Washington Conference Great Britain proposed the abolition of the submarine, and that France's opposition resulted in there being no limitation of numbers of submarines, cruisers, or other auxiliary combatant craft. This, however, is not quite the whole story. Nor so expressed is it entirely fair to France. France was not alone in her opposition to the abolition of the submarine. She was seconded by Italy and Japan, and certainly to some extent, by the United States. It is true that since France, Italy, and Japan recorded themselves in opposition to such abolition, the United States was not forced into the open with an absolutely clear statement of position by the American delegates. However, the American delegation did make a matter of record that the advisory committee of the American delegation was averse to the abolition of the submarine by the United States.

Of the seven treaties signed at the Washington Conference, all have been fully ratified, and are now in effect, except one. That one has been ratified by four of its signatory powers. Only France has failed to ratify it. The exception referred to is the treaty between the United States, Great Britain, Japan, France, and Italy in relation to the use of submarines and noxious gases in warfare. This treaty is more commonly referred to as the Submarine Treaty, and will be so called by the writer. In fact, there is really some official countenance to such a designation. A name for this treaty was discussed at the conference, and the American delegate who sponsored the treaty, said then it would probably be called the Submarine Treaty.

It is true that the Submarine Treaty is not in effect, and that it will not be until France ratifies, and that there is no immediate indication that France will so ratify. However, this treaty does not provide for the abolition of the submarine. There is not the same assurance that France will not ratify this treaty, which her delegates signed, as there seems to be that she will continue to oppose the submarine's abolition. When France so wills, this treaty will become effective.

The discussions at Geneva, while not always actually mentioning the submarine when the undersea boat was obviously the real consideration in the minds of the delegates, have made it evident again that in any future discussions of naval disarmament, interest will center principally on the submarine.

With the preparatory commission for the Disarmament Conference recently sitting in Geneva, preparing the agenda for that prospective conference, it may be well to survey the situation from the submarine viewpoint. It seems fairly certain that much the same propositions with regard to the submarine will be advanced by the nations most interested. That is, the various nations will probably again advocate the same action with regard to submarines that they did at Washington.

The Washington Conference limited naval armament in more ways than one. It limited the total tonnage of two types of warcraft that the respective nations might have. It also limited the size of various types of warcraft, and the size and number of guns that they might carry. These limitations are pretty clear, and are fairly well realized. But also the Washington Conference limited the availability of warcraft, and the manner

in which they might be used. These latter limitations are more subtle, and perhaps have evaded a considerable portion of the public.

The limitations upon availability resulting from article XIX of the Treaty for the Limitation of Naval Armament work to the disadvantage of the United States. The other signatory nations do not share that disadvantage in the same serious degree. The effect of article XIX, most unfortunately for the United States, is a large subject in itself.

There is a possibility that the limitations sought to be imposed upon the future operations of submarines in warfare may be found to be equally unbalanced, in so far as the effect for or against various nations is concerned. Even more important, from the standpoint of the practical, active naval officer, is to know just what submarines may and may not legally do in future wars. The naval officer generally cannot consider with judicial calm and deliberation when a decision is demanded in time of war. Consideration after the event will do him no good. The naval officer must study in advance, consider possible cases, and, when the crisis comes, make quick decisions, or his country's cause is lost. The first requisite is of course for him to know the rules of the game. Limitations on action must therefore be clear and unequivocal.

Although Great Britain did not succeed in having the Washington Conference abolish the submarine, it was Great Britain, and not the sponsoring United States delegate, that put the real teeth into the Submarine Treaty. Since the Washington Conference, and notably since the unfortunate accident to the British Submarine *M-1*, from British sources have come renewed proposals to abolish the submarine. Is it not probable that renewed efforts will be made at the approaching conference to abolish the submarine, or if that be impossible, to limit further its allowed activities?

The policy of the United States so far as expressed at the Washington Conference did not concur with the proposal to abolish submarines. Presumably then there must be a point at which the United States can no longer concur with proposals to limit the operations of submarines. That this point should be located by advance consideration seems worthy of attention.

For example, from a study of the conference proceedings, it appears that Mr. Balfour, the British delegate, suggested an amendment to the Submarine Treaty that the American delegation had not previously considered, and for which they were not prepared. That proposal of Mr. Balfour's found its way into the final form of the treaty. It is a fair question whether this would have been the case had this proposal been considered sufficiently in advance for all its effects to have been clear to the American delegation. In connection with that, it might be well to see how far along the road of limitation of submarine wartime operations the Submarine Treaty goes.

The powers that signed the Submarine Treaty were, as already noted, the same that signed the Treaty for the Limitation of Naval Armament. This is but natural, as the Submarine Treaty was also one on limitation of naval armament, one with implications and restrictions that are possibly but ill appreciated by many most vitally concerned.

The Submarine Treaty, as completed, was in a form different from that in which it was proposed originally by Senator Root. It included in its final form several commitments of the most serious import that were not in the articles of Senator Root's original proposal. The evolution of this treaty into its final form is of considerable interest.

When the attention is focused upon the Submarine Treaty, existing, as it were, in a state of suspended animation, certain questions suggest themselves. First, why has France not ratified this treaty which her delegates signed? Second, would it be a good thing for the United States if it were in effect?

The first question concerns the United States less directly than does the very pertinent second one. The second question suggests several other questions, the answers to which will assist in arriving at a composite answer to the second question.

(A) What is the submarine policy of the United States?

(B) How was the Submarine Treaty evolved?

(C) Is the Submarine Treaty a clear guide for a submarine commander?

(D) What did the Submarine Treaty finally stipulate?

(E) What effect would the Submarine Treaty have if it were in force?

(F) Does the Submarine Treaty accord with the submarine policy of the United States?

## WHAT IS THE SUBMARINE POLICY OF THE UNITED STATES?

The submarine policy of the United States may be ascertained by considering the following:

(a) The original proposal of the United States at the Washington Conference.

(b) The report on submarines by the advisory committee of the American delegation at the Washington Conference.

(c) The report of a special board appointed by the Secretary of the Navy September 23, 1924, "to consider the policy of the Navy Department with reference to upkeep of the Navy in its various branches," and transmitted by him to the chairman of the committee on naval affairs of the House of Representatives February 20, 1925.

(d) The present operations and present building of submarines.

(e) Recent statements by the Secretary of the Navy and the President.

*The original proposal of the United States at the Washington Conference.* That part of the proposal which pertains to submarines is quoted from the proceedings of the conference, as follows:

THE PROPOSAL OF THE UNITED STATES FOR A LIMITATION OF NAVAL ARMAMENT

(D) The use of capital ship tonnage as the measurement of strength for navies and a proportionate allowance of auxiliary combatant craft prescribed. (56).*

(b) *Submarines.* 20. It is proposed that the total tonnage of submarines allowed each power shall be as follows:

| | |
|---|---|
| For the United States | 90,000 tons. |
| For Great Britain | 90,000 tons. |
| For Japan | 54,000 tons. |

Provided, however, that no power party to this agreement whose total tonnage in submarines on November 11, 1921, exceeds the prescribed tonnage shall be required to scrap such excess tonnage until replacements begin, at which time the total tonnage of submarines for each nation shall be reduced to the prescribed allowance as herein stated.

*Limitation of new construction.* 21. (a) All submarines whose keels have been laid down by November 11, 1921, may be carried to completion.

(b) No new submarine tonnage except replacement tonnage as provided hereafter shall be laid down during the period of this agreement; provided, however, that such nations as have not reached the submarine tonnage allowed hereinbefore stated may construct tonnage up to the limit of their allowance.

22. Submarines may be scrapped in accordance with methods to be agreed upon. (61).

*Replacements.* 26. (c) Submarines twelve years of age from date of completion may be replaced by new submarine construction. The keels of such new construction shall not be laid until the tonnage it is intended to replace is eleven years of age from date of completion. (62).

Summarizing the foregoing, Great Britain and the United States were to be allowed 90,000 tons of submarines each, and Japan 54,000. No nation was to be required to scrap submarine tonnage until it was old and to be replaced, and all nations might finish submarine tonnage under construction.

This proposal was plainly not a suggestion that the submarine should be abolished. Nor did it in any degree propose any peculiar limitation upon the operations of submarines. Did it then constitute a proposed reduction in submarine tonnage for the various nations?

For the respective nations, their submarine tonnages, built and on building programs, for January 1, 1922, were in thousands of tons, as follows:

| *Nation* | *Built* | *On Building Program* |
|---|---|---|
| Great Britain | 75 | 8 |
| United States | 55 | 46† |
| Japan | 14 | 29 |
| France | 22 | 13 |
| Italy | 18 | 3 |

In no case did a nation's existing submarine tonnage equal or come near equalling the limit proposed. In all cases but one the combined tonnage existing, building and authorized, fell below the limit proposed. And in that one case, the United States, the

* Reference to authorities for quotations or statements is made by a reference group in parenthesis. The list of authorities will be found in the appendix, each with its distinguishing letter. A reference group will therefore indicate the authority by a letter, and the page of that authority by a number. For example, (B-123) would refer the reader to authority B, page 123. As by far the largest number of references will be made to authority A, in that single case, the letter will be omitted. Therefore a reference group consisting of a number only will refer to a page of authority A.

† This figure included six fleet submarines for which contracts had not yet been placed. The figures in the foregoing tabulation are based upon tables in "The Navy Year Book," 1920 and 1921. (B-898, 895, and 885).

excess of this total combination tonnage was but slight. And of the existing tonnage, twenty-seven boats were stated by the Secretary of the Navy to be "of limited military value," and undoubtedly upon the completion of replacement tonnage, sufficient could have been scrapped to keep within the proposed limit without serious military loss. (C-41.)

From these figures it is evident that the original American proposal at the Washington Conference did not entail any slash of submarine tonnage, nor any curtailment of their legitimate operations.

In fact, in the report of the American delegation, submitted to the President February 9, 1922, appears the following:

> The American delegation felt that the original proposal for submarines was too high, and aided by the advice of our naval experts, proposed that the maximum limit for the United States and Great Britain in submarine tonnage should be 60,000 tons each; and that France, Japan, and Italy should retain the tonnage in submarines that they now have, that is, should maintain the *status quo* as regards submarine tonnage. It was understood that the present submarine tonnage of France was 31,391 tons; of Japan 31,452 tons; and of Italy somewhat less, about 21,000 tons. This proposition was not accepted, being opposed by both Japan and France. (804).

*The Report on Submarines by the Advisory Committee of the American Delegation.* At the Washington Conference, after the British had proposed the abolition of the submarine, and France, Japan, and Italy had expressed opposition to such abolition, the chairman, Mr. Hughes, made various observations, including the following:

> Upon the question whether the submarine was of value for defense, each nation must take the opinion of its naval experts. Indications of differences of opinion had already been manifested. He *would not at this time make any announcement of the position of the United States* [Author's italics], except to add to the expressions of detestation of the abuse of the submarine and of the methods—the illegal methods, as they have been continually called—of their employment during the war.
>
> He wished, however, to read a report. The President had appointed an advisory committee to aid the American delegation. The members of that committee were gathered together, men and women, from all fields of activity, from all parts of the country, and represented every shade of public opinion. That committee had considered this subject and the subcommittee to which it was referred was headed by a distinguished admiral of the American Navy. [AUTHOR'S NOTE. Rear Admiral W. L. Rodgers, of the General Board.] The report was debated in full committee and was unanimously adopted—even by those who were prepossessed against the submarine. He read this report, *not as an opinion of the American Government* [Author's italics.] but as a report of the advisory committee, which was created in order that the American delegates might be advised as to public opinion. (272-273.)
>
> The chairman then read the following report on submarines adopted by the advisory committee of the American delegation on December 1, 1921. (273).

The foregoing seems pretty clearly to stamp the committee's report at least as a respectable and authoritative expression of American opinion, but to deny it the prestige of being a statement of the American Government's position. The limiting qualification was, of course, by but one individual member of the American delegation. There seems to have been some change in this limiting attitude before the American delegation submitted its report to the President dated February 9, 1922, for in their report, the delegation says, in discussing the British proposal to abolish the submarine:

> The proposal was discussed at length, the British delegation bringing forward in its support arguments of great force based upon the experience of Great Britain in the recent war. It met with opposition from France, Italy, and Japan.
>
> The American delegation not only had the opinion of their naval advisers in opposition to the proposal, but also had received a careful report upon the subject from the advisory committee of twenty-one appointed by the President. *This report was presented by the American delegation as setting forth in a succinct manner the position of their Government.* [Author's italics.] (813).

The committee's report covers only about four pages. It is a remarkably fine monograph upon the legitimate usefulness of the submarine, brief but comprehensive, and can be read with profit by anyone. Even in its comparatively brief report to the President, the American delegation to the Washington Conference included the following extracts from the report of the advisory committee:

> Unlimited submarine warfare should be outlawed. Laws should be drawn up prescribing the methods of procedure of submarines against merchant vessels both neutral and belligerent. These rules should accord with the rules observed by surface craft. Laws should also be made which prohibit the use of false flags and offensive arming of merchant vessels. The use of false flags has already ceased in land warfare. No one can prevent an enemy from running "amuck" but immediately he does, he outlaws himself and invites sure defeat by bringing down the wrath of the world upon his head. If the submarine is required to operate under the same rule as combatant sur-

face vessels no objection can be raised as to its use against merchant vessels. The individual captains of submarines are no more likely to violate instructions from their government upon this point than are captains of any other type of ship acting independently.

*Submarines against combatant ships.* Against enemy men of war the submarine may be likened to the advance guard on land which hides in a tree or uses underbrush to conceal itself. If the infantry in its advance encounters an ambuscade, it suffers greatly even if it is not totally annihilated. However, an ambuscade is entirely legitimate. In the same fashion a submarine strikes the advancing enemy from concealment and no nation cries out against this form of attack as illegal. Its navy simply becomes more vigilant, moves faster, and uses its surface scouts to protect itself.

The submarine carries the same weapons as surface vessels, i.e., torpedoes, mines, and guns. There is no prohibition of their use on surface craft and there can be none on submarines. Submarines are particularly well adapted to use mines and torpedoes. They can approach the desired spot without being seen, lay their mines or discharge their torpedoes, and make their escape.

The best defense against them is eternal vigilance and high speed. This causes added fatigue to the personnel and greater wear to the machinery. The continual menace of submarines in the vicinity may so wear down a fleet that when it meets the enemy it will be so exhausted as to make its defeat a simple matter.

The submarine as a man-of-war has a very vital part to play. It has come to stay. It may strike without warning against combatant vessels, as surface ships may do also, but it must be required to observe the prescribed rules of surface craft when opposing merchantmen, as at other times.

*The submarine as a scout.* As a scout the submarine has great possibilities—it is the one type of vessel able to proceed unsupported into distant enemy waters and maintain itself to observe and report enemy movements. At present its principal handicaps are poor habitability and lack of radio power to transmit its information. However, these may be overcome in some degree in the future. Here, again, the submarine has come to stay—it has great value, a legitimate use, and no nation can decry its employment in this fashion.

* * * *

The submarine is particularly an instrument of weak naval powers. The business of the world is carried on upon the surface of the sea. Any navy which is dominant on the surface prefers to rely on that superiority. While navies comparatively weak, may but threaten that dominance by developing a new form of attack to attain success through surprise. Hence submarines have offered and secured advantages until the method of successful counter-attack has been developed.

The United States Navy lacks a proper number of cruisers. The few we have would be unable to cover the necessary area to obtain information. Submarines could greatly assist them as they can not be driven in by enemy scouts.

The cost per annum of maintaining 100,000 tons of submarines fully manned and ready is about thirty million dollars. For the work which will be required of them in an emergency, this cost is small when taken in connection with the entire Navy. The retention of a large submarine force may at some future time result in the United States holding its outlying possessions. If these colonies once fall the expenditure of men necessary to recapture them will be tremendous and may result in a drawn war which would really be a United States defeat. The United States needs a large submarine force to protect its interests.

This committee is therefore of the opinion that unlimited warfare by submarines on commerce should be outlawed. The right of visit and search must be exercised by submarines under the same rules as for surface vessels. It does not approve limitation in size of submarines. (813).

*The Report of the Special Board to Consider the Upkeep of the Navy in its Various Branches.* This classic report was transmitted by the Secretary of the Navy to the committee on naval affairs of the House of Representatives for its information, by letter dated February 20, 1925.

The personnel of the board was such as to give it the highest authority. It included the Chief of Naval Operations, the Commandant of the Marine Corps, the President of the Naval War College, the chairman of the executive committee and two other members of the general board of the Navy, the budget officer of the Navy, and the Director of Naval Intelligence. Of the eight flag and general officers on the board, two were ex-commanders-in-chief of the principal fleet, and others had held high command afloat.

As this article is concerned primarily with submarines, the extracts to be quoted from the board's report will pertain only to submarines, but there is no intention to appear to give the undersea boats undue prominence as a component of the fleet. The report makes it very clear that in the board's opinion the battleship is the backbone of the fleet, and that other types of vessels, including also aircraft and submarines, are but auxiliary.

Subject to the foregoing explanation, or qualification, the following extracts from the board's report are quoted:

159. The board is of the opinion that submarines are an essential part of our national defense; that efficient submarines are necessary to a well balanced fleet; that additional fleet submarines must be provided; that mine-laying submarines must be provided; and that all submarines must be a part of the fleet in order to develop their maximum value in war and to maintain the efficiency of personnel and material. (D-409).

209. The mission of the Navy is to defend our national rights and interests.

211. The object of the Navy would be: first, to destroy or blockade the enemy fleet in order; second, to protect our commerce; then, third, to destroy the enemy's commerce in order; fourth, to bring economic pressure to bear on him; and if our rights still continued to be denied; fifth, to transport the Army in order; sixth, to break down remaining enemy resistance. (D-418).

Extract from Conclusions:

265. A properly constituted fleet consists of battleships, battle cruisers, cruisers, aircraft carriers, aircraft, destroyers, submarines, mine layers, and auxiliaries. (D-426).

288. Substantial progress has been made in the development of the submarine since the World War. Its radius of action and surface speed have been so increased that it will be of great value in distant scouting, mine laying, and offensive operations with the fleet.

289. The Navy Department policy (promulgated December 1, 1922), which was formulated immediately following the treaty limiting naval armament, takes account of the development and potentiality of aircraft and submarines, is sound, and should be adhered to. . . . . (D-428).

Extract from Recommendations:

291. *Fleet submarines.*—Maintain a tonnage strength based on a 5-5-3 ratio.

292. (d) That the three remaining fleet submarines already authorized by Congress, be laid down during the fiscal year 1927. (D-429).

Extract from United States Naval Policy:

(Promulgated December 1, 1922, consistent with the Treaty for the Limitation of Naval Armament. This policy was referred to with approval by the special board.) (E.)

*Submarines*

To complete submarines now building.

To maintain effective submarine tonnage in conformity with capital ship ratios.

To develop and build twelve scout submarines and twelve mine-laying submarines, and thereafter to limit new construction to that necessary to maintain effective submarine tonnage in conformity with capital ship ratios.

To scrap no submarine unless its material condition or its military characteristics make it undesirable for retention. (D-431).

*Operating Policy*

To keep all submarines fully manned and in active training. (D-434).

*The Present Operations and Present Building of Submarines.* In his report for 1925, the Secretary of the Navy states that eighty submarines, first and second lines, were maintained in full commission with the forces afloat during the entire year. (F-4.)

In his 1922 report he states that on July 1, 1921, there were seventy-six submarines in full commission, and on July 8, 1922, there were eighty-three in full commission. (C-41.)

Evidently, then, there has been no falling off or appreciable change, since before the Washington Conference, of the number of submarines maintained in full commission.

At the time of the Washington Conference there were some thirty or forty submarines under construction. These were principally boats of the *S* class, of about 900 tons displacement, since completed. They were a war product.

In his 1925 report, the Secretary of the Navy mentions the commissioning of the fleet submarine *V-1*, the completion of the *V-2*, the approaching completion of the *V-3*, and *V-4*, and the prospective laying down in the near future of two more fleet submarines, the *V-5* and *V-6*. These numbers are less than in 1921, with its wartime inheritance, but when it is remembered that the boats individually displace more than twice what the *S* class did, the apparent disparity in tonnage under construction is reduced.

The present rate of construction of submarines is not as great as that contemplated by the naval policy already quoted, nor are so many classes of underwater boats being built as it recommended. But the main point is that construction of submarines does still continue, manifestly by authority of Congress, which votes the money.

Under the subject of fleet maneuvers, among other remarks, the Secretary of the Navy, in his 1925 report, states:

The combined operations of aircraft, submarines, and surface vessels again proved the value of each type and demonstrated the interdependence of these three arms of the Navy. The increased power that is given to a naval force when these three arms have been properly developed and are acting together was clearly proved. (F-37).

*Recent Statements by the Secretary of the Navy and the President.* There is no need to amplify the preceding statement of the Secretary of the Navy, showing his appreciation of the important and useful rôle of the submarine.

President Coolidge, under date of December 6, 1923, in a message to Congress is quoted as follows:

For several years we have been decreasing the personnel of the Army and Navy and reducing their power to the danger point. Further reductions should not be made. The Army is a guarantee of the security of our citizens at home; the Navy is a guaranty of the citizens abroad. Both

of these services should be strengthened rather than weakened. Additional planes are needed for the Army and additional submarines for the Navy. The defenses of Panama must be perfected. We want no more competitive armaments. We want no more war. But we want no weakness that invites imposition. A people who neglect their national defense are putting in jeopardy their national honor. (G-31).

## How Was the Submarine Treaty Evolved?

The Submarine Treaty, if it become effective, will be the future guide of those who direct and command submarines in war. It would have been desirable for the treaty itself to have been so worded that it would constitute a clear rule of conduct.

That this is not the case is mentioned by Hector Bywater in his recent book, *The Great Pacific War*. He describes an imaginary incident that occurred near the Panama Canal, after a Japanese merchantman had been blown up in the canal, blocking it for months. The United States took various precautions to prevent similar acts, including stationing submarines on patrol duty some distance off the approaches to the canal. The U. S. Submarine *S-4* sighted a Japanese merchantman, and attempted in what is the present regular legal way to visit and search her. The merchantman attempted to avoid search by flight. She was fired upon in a circumspect manner by the submarine, seized and taken into port. As imagined by Mr. Bywater, the point was at once raised by Japan that this constituted a breach of the Submarine Treaty. (H-26.)

The Submarine Treaty is based upon resolutions introduced at the Washington Conference by no less a person than Senator Elihu Root, international lawyer, former Secretary of State, and one of the American delegates to the conference. Mr. Root's resolutions and the corresponding articles of the Treaty that resulted will be shown in parallel columns, for convenience of reference.

| *Resolutions Proposed By Mr. Root* | *The Submarine Treaty, Articles I-IV* |
|---|---|
| | *Article I* |
| I The signatory powers, desiring to make more effective the rules adopted by civilized nations for the protection of the lives of neutrals and noncombatants at sea in time of war, declare that among those rules the following are to be deemed an established part of international law: | The signatory powers declare that among the rules adopted by civilized nations for the protection of the lives of neutrals and noncombatants at sea in time of war, the following are to be deemed an established part of international law: |
| 1. A merchant vessel must be ordered to stop for visit and search to determine its character before it can be captured. | (1) A merchant vessel must be ordered to submit to visit and search to determine its character before it can be seized. |
| A merchant vessel must not be attacked unless it refuse to stop for visit and search after warning. | A merchant vessel must not be attacked unless it refuse to submit to visit and search after warning, or to proceed as directed after seizure. |
| A merchant vessel must not be destroyed unless the crew and passengers have been first placed in safety. | A merchant vessel must not be destroyed unless the crew and passengers have been first placed in safety. |
| 2. Belligerent submarines are not under any circumstances exempt from the universal rules above stated; and if a submarine cannot capture a merchant vessel in conformity with these rules the existing law of nations requires it to desist from attack and from capture and to permit the merchant vessel to proceed unmolested. | (2) Belligerent submarines are not under any circumstances exempt from the universal rules above stated; and if a submarine cannot capture a merchant vessel in conformity with these rules the existing law of nations requires it to desist from attack and from seizure and to permit the merchant vessel to proceed unmolested. |
| | *Article II* |
| The signatory powers invite the adherence of all other civilized powers to the foregoing statement of established law to the end that there may be clear public understanding throughout the world of the standards of conduct by which the public opinion of the world is to pass judgment upon future belligerents. | The signatory powers invite all other civilized powers to express their assent to the foregoing statement of established law so that there may be a clear public understanding throughout the world of the standards of conduct by which the public opinion of the world is to pass judgment upon future belligerents. |
| | *Article IV* |
| II The signatory powers recognize the practical impossibility of using submarines as commerce destroyers without violating the requirements uni- | The signatory powers recognize the practical impossibility of using submarines as commerce |

versally accepted by civilized nations for the protection of the lives of neutrals and non-combatants, and to the end that the prohibition of such use shall be universally accepted as a part of the law of nations, they declare their assent to such prohibition and invite all other nations to adhere thereto.

destroyers without violating, as they were violated in the recent war of 1914-18, the requirements universally accepted by civilized nations for the protection of the lives of neutrals and non-combatants, and to the end that the prohibition of the use of submarines as commerce destroyers shall be universally accepted as a part of the law of nations they now accept that prohibition as henceforth binding as between themselves and they invite all other nations to adhere thereto.

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III The signatory powers, desiring to insure the enforcement of the humane rules declared by them with respect to the prohibition of the use of submarines in warfare, further declare that any person in the service of any of the powers adopting these rules who shall violate any of the rules thus adopted, whether or not such person is under orders of a government superior, shall be deemed to have violated the laws of war, and shall be liable to trial and punishment as if for an act of piracy, and may be brought to trial before the civil or military authorities of any such powers within the jurisdiction of which he may be found.

*Article III*

The signatory powers, desiring to insure the enforcement of the humane rules of existing law declared by them with respect to attacks upon and the seizure and destruction of merchant ships, further declare that any person in the service of any power who shall violate any of those rules, whether or not such person is under orders of a government superior, shall be deemed to have violated the laws of war and shall be liable to trial and punishment as if for an act of piracy and may be brought to trial before the civil or military authorities of any power within the jurisdiction of which he may be found.

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Mr. Bywater makes the following comment:

It will be seen that the rules laid down as above were to some extent contradictory. On the one hand, a submarine was authorized by implication to detain, visit, and search a merchant vessel, and equally by implication to attack such a vessel if it refused to submit to visit and search. On the other hand, the submarine was expressly forbidden to persist with the attack if it seemed impossible to capture the merchant vessel without endangering the lives of non-combatants on board. Finally, the signatory powers, of whom the United States was one, had in the concluding paragraph virtually bound themselves not to employ submarines against merchant vessels under any circumstances whatever. (H-28.)

He then proceeds to state the justifying reasons given by the United States, which are based upon the fact that the case was an exceptional one, that the merchant vessel was a suspicious one, and that the submarine should have had the same rights as a surface vessel. While these reasons appeal to the sense of equity and justice, they do not seem to find support affirmatively stated in the treaty itself. That the propriety of these acts is implied by the treaty merits consideration, but implied rights have always been prolific of discussion and dissension.

In trying to understand just what the Submarine Treaty means, the first thing is, of course, to study the treaty itself. That seems to result in ambiguity, as there appears to be a contradiction between Articles I and IV. The next place to look for light is then the exposition of the delegate whose resolutions resulted in the treaty, perhaps modified by other comment, question, and reply. That the writer has done, by studying the minutes of the committee on limitation of armament, of the Washington Conference.

Pertinent quotations have been extracted, in order that the reader may judge for himself. Some statements might seem incredible were the most authoritative references not at hand.

It should be noted that the numbering of the articles and paragraphs in the resolutions and the treaty do not coincide. Attention is particularly invited to this point in connection with comment that may be quoted or referred to, as a failure to note it will result in confusion. It is hoped that the parallel columns already given will assist a clear understanding.

*Questions Arise.* Senator Schanzer (Italian delegate) found it difficult to separate the first from the second resolution, "which definitely prohibited the use of submarines for the destruction of merchant craft. The first resolution, on the contrary, admitted, in determined cases the destruction of merchant craft after certain provisions had been observed. He would therefore like to know in what way the second resolution tallied with the first." (326.)

"In the second place, Senator Schanzer believed that it might be useful to give a clear definition of merchant craft in order to make them recognizable, and to establish plainly in which cases a submarine should abstain from attacking a ship and in which cases, on the contrary, attack was to be admitted, as, for example, in the case of a merchantman regularly armed or of a privateer." (327.)

Mr. Borden (Canadian delegate) stated that he understood Mr. Root to have stated in article one what were the existing rules, and that article two "was intended to mark a notable and most desirable advance on the existing rule." (327.)

*Inconsistency Admitted.* Mr. Root said that Senator Schanzer had asked some questions to which he would reply.

> First as to the agreement of Article I, of the resolutions now before the committee, with the second article relative to the prohibition of making use of submarines as commerce destroyers, which Senator Schanzer deemed inconsistent with Article I.
>
> Article I was a statement of existing law; Article II *if adopted,* [author's italics] would constitute a change from existing law and therefore it was impossible to say that it was not inconsistent. If it were not inconsistent, there would be no change. Article II could not be consistent with Article I and still make a change. (328.)
>
> Senator Schanzer had also suggested that Resolution I be completed by including the definition of a "merchant ship". Throughout all the long history of international law no term had been better understood than the term "merchant ship." (328.)
>
> [Later on] Mr. Root said that he had omitted in answering Senator Schanzer's very discriminating question regarding the relations between Articles I and II to say that, of course, if the second article were adopted by all the world, it would supercede Article I. This, however, would be a long slow process and during the interval the law as it stood must apply until an agreement was reached. Article I also explained in authorized form the existing law and could be brought forward when the public asked what changes were proposed. In proposing a change, he said, it was necessary to make clear what the existing law was. It was very necessary to link this authoritative statement in Article I with the new principle proposed in Article II. (332.)
>
> "Sir John Salmond (Canadian delegate), said that while not doubting the substantial accuracy of the resolutions . . . . the resolutions . . . . as they stood were not free from ambiguities and formal defects . . . . he thought opportunity should be given for verbal amendments. For example: Paragraph 3 of rule 1 stated that a merchant vessel must not be destroyed unless the crew and passengers had first been placed in safety. Was this intended to give absolute immunity to the merchant ship from attack unless the crew and passengers had been first placed in safety? Was this intended to give absolute immunity to the merchant ship from attack unless the crew and passengers were first placed in safety even although the ship had refused to stop on being warned? Read literally this would be the effect of the rule. Secondly, the relation between resolutions I and II did not appear in the text and a verbal explanation by Mr. Root was necessary to explain it. . . . . While therefore he was in absolute agreement with the substance of Mr. Root's resolutions, he thought there was no haste which would justify the committee not being given opportunity for the examination and formal amendment of these resolutions." (332.)

It would be interesting to have an authoritative answer to these questions, so pertinent from the standpoint of a naval officer. But the minutes show that at this point Senator Lodge (United States delegate), without attempting to answer the questions, proceeded with a statement the gist of which was contained in these words:

"The committee could easily take care of the amendments suggested by Mr. Salmond. The delegates were here to settle a policy and must do so." Senator Lodge's statement breathed a certain impatience at delay by such questions.

Senator Schanzer, after a diplomatic preamble expressing sympathy with Mr. Root's proposals, stated:

> That his observations had not been useless was shown by the explanation that Mr. Root had been kind enough to give him, and for which he thanked him. He had asked to know in what way Resolution II was to be understood, in respect to Resolution I. In fact, the systems contemplated in the first and second resolutions could exist at the same time. (335.)

The context seems clearly to indicate that the minutes are in error here, and that the word "not" should appear before "exist" in the preceding sentence. This is made particularly apparent as Senator Schanzer elaborates his observation in the following paragraph.

> Resolution I declared an existing law regarding submarine warfare, which admitted in certain cases and subject to certain observances, even the destruction of merchant ships. Resolution II condemned in the most absolute way the use of submarines for the destruction of merchant ships. Mr. Root had now explained that Resolution II represented a new and subsequent phase to which things must tend. He felt this ought to be more clearly expressed in the wording of the resolution. . . . . (335.)

Mr. Balfour (British delegate) expressed sympathy with the resolutions. His speech contained the frankly significant words:

The members of that delegation would have preferred that the document itself should have been rendered unnecessary by the abolition of submarines. Since they had not been able to carry out this policy, however, Mr. Root's resolution provided them with an alternative. If they could not hold their first line of defense, they had at least a second line to fall back on, for in Mr. Root's document the abuse of submarines had been unsparingly dealt with. (338.)

Finally the first resolution was adopted in principle by the committee, subject to reference to a drafting committee that would "consider the form of expression and such verbal changes as might be deemed advisable." (341.)

At a subsequent meeting of the committee Mr. Root's original first resolution came from the drafting committee as two resolutions, I and II.

It will be noted that these two resolutions, which are really Mr. Root's one original first resolution, ultimately became Articles I and II of the treaty. To avoid confusion, it must be noted, however, that in the discussion preceding their adoption, the reference to "articles" was really to "paragraphs" of what finally was Article I of the treaty, and the reference to "paragraphs" meant the unnumbered small paragraphs in the paragraph numbered one. The context shows this if closely read.

*Italian Reservations.* Before these resolutions were accepted:

Mr. Root stated . . . . that Senator Schanzer had requested that the following entries be made in the minutes of the sub-committee:

"It is declared that the meaning of article 2 is as follows: Submarines have the same obligations and the same rights as surface craft."

And: "with regard to the third paragraph of article 1, it is understood that a distinction is made between the deliberate destruction of a merchant vessel and the destruction which may result from a lawful attack in accordance with the rules of the second paragraph. If a war vessel under the circumstances described in paragraph 2 of article I lawfully attacks a merchant vessel, it cannot be held that the war vessel, before attacking, should put the crew and passengers of the merchant vessel in safety." (364.)

In voting upon the acceptance of these resolutions:

Senator Schanzer stated that the Italian delegation accepted Resolution I but that, so far as they were concerned, the application of the resolution was subject to the two statements made by him in the subcommittee as entered on the minutes of the first meeting (December 31, 1921) of the subcommittee of five on drafting, and as just read by Mr. Root. (365.)

Resolutions I and II were adopted, and became Articles I and II of the treaty.

*Not to be Immediately Binding.* When the chairman of the committee, Secretary Hughes, introduced Mr. Root's original second resolution for consideration, Mr. Hughes spoke as follows in discussing that resolution. In mentioning first or second resolutions he referred to original first or second resolutions.

As Mr. Root had explained, this was a proposition to change the law. The first resolution attempted to state the law, the law which had been ignored and which had been trampled under foot, but which nevertheless had been and still was regarded as international law. This resolution fundamentally recognized, however, the practical impossibility of using submarines as commerce destroyers without violating the requirements universally accepted by civilized nations for the protection of neutrals and noncombatants. He assumed the resolution to mean that, while the rules of war were as stated in the first resolution—at least in substance—and while it was the sense of the powers there represented that they should be adhered to and clearly understood, the civilized world should be asked to outlaw the submarine as a weapon against commerce. (341.)

The point had been made that morning that there might be question in regard to the assent of the powers here represented to the prohibition, i.e., in relation to the last words of the resolution, which provided that the powers here represented were to invite all other nations to adhere. He supposed that this meant that, if the prohibition should receive the assent of the powers here represented, they adopted it in the hope that it would be made a part of international law upon the adherence of all other powers—not that it would become binding upon the powers here represented, if it did not become a part of international law, and if others by their refusal to assent prevented it from becoming a general principle. He assumed that the intention of the resolution was not that these powers should try to make international law for themselves, which, of course, they could not do, but that they should use their influence to obtain the adherence of nations to a new rule of law outlawing the submarine as a destroyer of commerce. (342.)

Mr. Root said the chairman had correctly stated the sense of the closing words of the resolution; it was to the end that the prohibition of the use of submarines should be universally accepted. Two things were done in the resolutions. First a declaration was made, then an assertion. If a single nation were to lead with such a proposal, it might have no effect. It required universal assent to establish a law of nations. There was a difference between the second and first resolutions. The first was a declaration of existing law, and created nothing, merely certifying to what existed. The second resolution

called for an act which did not take effect until assent had been received. (342.)

*Mr. Balfour's New Proposition.*—Mr. Balfour said he would like to make a suggestion to Mr. Root. He understood Mr. Root's view to be that the powers represented on this committee were only endeavoring to initiate a great reform of international law, by declaring their own view and pledging themselves to induce other nations if possible to support it. He desired to ask whether he could not go a little further? Why should not the five nations represented here agree themselves to act on the rule which Mr. Root proposed? . . . . Nothing could be better as an example than that the five states, instead of merely adopting a resolution which would be inoperative until generally adopted, should adopt immediately the principles which they desired eventually to see embodied in international law? . . . . (342.)

Mr. Root talked at some length with regard to Mr. Balfour's proposal, but always sympathetically. In the course of his discussion:

He observed, speaking for himself, and without opportunity to consult the other members of the American delegation, or without intending to speak for them, that it would be entirely satisfactory as far as he was concerned to have such an addition to this second prohibition as Mr. Balfour had suggested. It was an addition providing for the five powers who were here and who would be bound as between each other, and he observed that he was sure that every power at the conference intended to shape its conduct in accordance with the rule proposed. . . . . Now this was a proposal . . . . that . . . . saved the submarine for legitimate purposes and banned only the injurious use of submarines. It substituted a general prohibition for a detailed prohibition—the rule which they had just recognized in their action upon the first resolution. . . . . (343.)

When the German submarines began torpedoing innocent merchant ships and when they had stopped them for the purpose of visit and search and had begun to place bombs in the hulls and blow up vessels, indignant protests were made. *The German answer was that it was impossible to comply with the rules that had been made to govern the action of surface ships. There was an agreement upon that. Germany declared it to be impossible, and it was impossible. The submarines could not successfully carry on warfare against merchant ships and summon them in the ordinary way to stop for visit and search.* [Author's italics.] And when a vessel had been stopped for visit and search, the submarine could not put its crew and passengers in safety because the work was done while the submarine itself was in danger from which it could escape only by swift submersion. . . . . Germany's assertion that it was impossible for the submarine to war on merchant ships in accordance with these rules was well founded, and for one, the government of United States assented to it, agreed to it, admitted it. But they said the consequence was not that the rule failed, but that such warfare must end. (344.)

Certainly naval officers cannot assent to all of the foregoing statement. And they are second to none in their condemnation of ruthless submarine warfare in violation of the laws of war, and of humanity. It is regrettable that an authoritative statement should have been made that gave any semblance of concurrence with the German defense of ruthless warfare. Naval officers know that such a defense is false. The rule existed. It was just as plain for submarines as for surface craft. The submarines were bound, as are surface craft, to keep within the prohibitions of the rules. When any desired operation could not be effected and still keep within the rule, the operation could not be legally undertaken, or completed. That was all there was to it, and all there is to it today.

Until the Submarine Treaty becomes effective, it is still a fact that *in some cases* a submarine may operate against commerce, both efficiently and legally, as every naval officer knows. (This was admitted by Mr. Hughes in his remarks yet to be quoted.) But this paper is primarily concerned with the attempt to understand just what the Submarine Treaty does mean. Secondarily, of course, one cannot help but draw conclusions as to concurrence in the correctness of the assumptions upon which it is based, as to its wisdom, and as to whether or not it is a radical departure from the previous policy of the United States, even as stated at the conference itself. Both the primary and secondary conclusions should have real value in the further consideration of the submarine question, which is so liable to be revived at the approaching limitation of armament conference.

Mr. Root continued:

There was no fact more firmly established than that all the temptations that beset a belligerent to gain its point at whatever cost would stand between the submarines and conformity with civilized procedure. The only way to secure the safety of innocent passengers and crews . . . . was to say that no belligerent should attack a merchant ship through an instrumentality which can not achieve the attack without violating the rule. It created a simple and forcible rule in the place of the complicated and detailed rules which were required by the weakness of human nature. Mr. Root said a forcible rule, because a rule that could be understood by the people. . . . . (344.)

Mr. Hughes, the chairman, among other remarks, stated:

> The other proposal, which had been made by Mr. Balfour and accepted by Mr. Root, was that .... the five powers represented on the committee should bind themselves, as among themselves, not to use the submarine for the destruction of commerce. .... So far as the American delegates were concerned there was no doubt as to the approval of the policy. It was really a practical application of existing rules, as it was *only in exceptional cases* [Author's italics] that submarines could operate successfully against commerce and the existence of the exceptional cases constituted an invitation and temptation to violation of the law. .... (345.)

"Mr. Balfour said the chairman had pointed out that the discussion had brought two propositions before us: First, the change in the international law proposed in (the original) Article II of Mr. Root's resolutions, and second, the addition which he himself had suggested in that resolution whereby the powers represented on this committee would bind themselves immediately to accept and act upon the new policy as between themselves. He thought it would assist the consideration of this question if he were to give the exact words in which his own proposal should be formulated. He would amend the last part of Article II so as to read as follows:

> They declare their assent to such prohibition, and they agree to be bound forthwith thereby as between themselves, and they invite all other nations to adhere to the present agreement." (345.)

At a subsequent meeting, original Resolution II, now Resolution III, which was to become Article IV of the Treaty, came up for further discussion.

*Further Questions Arise.* "Lord Lee (British delegate) asked what was the precise meaning of the term 'commerce destroyer?' In a recent speech Mr. Root had said that the submarine was unfitted for attacks on commerce. He did not know if 'commerce destroyer' was a recognized legal term, or whether it included the processes of attack and seizure referred to in the first resolution." (371.)

"Mr. Root said he believed it *covered the whole process.* [Author's italics.] He thought that 'commerce destroyer' was a perfectly well-known term."

"Mr. Root said he thought that if the committee undertook to go into details of the process, it would find itself involved . . . ." (371.)

"Lord Lee said that it had been suggested by technical experts that in view of the paragraph in the first resolution in regard to putting passengers and crew in safety, the term 'commerce destroyer' would apply only to that. If there were any doubts, it was desirable that they should be cleared up." (371.)

Mr. Lodge supported Mr. Root's view that the attempt to go from the general to the specific was inadvisable. He thought that "when one came to making catalogues one ran a great risk." . . . . (371.)

The foregoing is of particular interest but little comfort to naval officers, in view of Article III of the treaty as finally adopted.

Mr. Hanihara (Japanese delegate) said he desired to be informed with respect to the exact meaning of the term 'commerce destroyer.' As he had already pointed out in a previous discussion, he believed that the words were intended to apply to vessels suitable for the destruction of merchant shipping. He said he thought it was also clear that merchant vessels engaged in giving military assistance to the enemy ceased, in fact, to be merchant vessels. There was, however, another point. It seemed apparent that, if the resolution were adopted, it excluded the use of submarines for purposes of blockade. It did not appear to him possible to use submarines for this purpose in conformity with rule 1. Mr. Hanihara then asked whether this interpretation was correct." (372.)

*Submarines Forbidden as Blockading Vessels.*" Mr. Root said he thought that the prohibition would apply to submarines attacking or seizing or capturing or destroying merchant vessels *under any circumstances* [Author's italics] so long as the vessel remained a merchant vessel; he also thought it was necessary to have an effective prohibition, to have it so apply. It was merely a question of the use of words. Germany, for instance, declared a blockade of the whole British Channel. One could say 'blockade,' and the rule would disappear. (372.)

"Senator Schanzer said that he must decline, in the name of the Italian delegation, the above interpretation." (372.)

Then followed discussion in which Senator Schanzer made it plain he believed that

the use of submarines in blockade was not prohibited by the resolutions. (374.)

Mr. Balfour pointed out at some length that this limitation on the prohibition would defeat the purpose of the resolution. (374.)

Finally "Senator Schanzer said the Italian delegation was inspired by a spirit of conciliation . . . . . Submarines were military weapons and should be allowed the privileges of military weapons. They might even act in the same way as surface vessels. The entire question of blockade had been brought up by the Japanese delegate. If the Japanese delegate withdrew his objections and all the other delegates agreed, the Italian delegation would not prevent the common resolve being carried into effect." (375.)

"Mr. Hanihara said that he had made his previous inquiry in order to be informed with respect to 'commerce destroyers' and the use of submarines for the purposes of blockade. He had not, however, intended to enter any objection to the prohibition of the use of submarines for blockade. (375.)

"The chairman (Mr. Hughes) said he understood that, in the light of the statement by Mr. Hanihara, Senator Schanzer would withdraw his suggestion as to the limitation of the prohibition, and he assumed the resolution would then be acceptable to all the powers represented on the committee." (375.)

Resolution III, which is Article IV of the treaty, was then unanimously adopted. (375.)

*Treaty Article III.* At a subsequent meeting was considered original Resolution III now become Resolution IV, which was to become, as amended, Article III of the treaty.

Senator Schanzer proposed that the penalties should be made applicable not only to submarine personnel, but to that of surface craft as well. (378.)

Senator Pearce (Australia) suggested that the penalties should apply to the personnel of the ships of all powers, and not just to those of the signatory powers. (378.)

Sir John Salmond brought up the question as to whether these penalties were to apply to breaches of all the rules of the treaty, or only to those already recognized as international law, and stated as Article I of the treaty. He assumed that the penalties referred only to breach of rules stated in Article I. (379.)

With this Mr. Hughes and Mr. Root agreed, and as a result of this suggestion, it was decided to make the resolution under discussion immediately follow Articles I and II already adopted, and precede what had been adopted as Resolution III. (382-383.)

Accordingly Resolution IV was adopted as amended, and became Article III of the treaty.

Mr. Root's subsequent remarks, when presenting the Submarine Treaty to a plenary session of the conference, at which it was adopted, do not throw additional light upon its specific interpretation.

### Is the Submarine Treaty a Clear Guide for a Submarine Commander?

Mr. Bywater, as already quoted, has called the rules of the Submarine Treaty "to some extent contradictory." (H.-28.)

Pearce Higgins, referring to this treaty, says:

> The ambiguity of the term "commerce destroyer" weakens the force of the declaration of the signatory powers. . . . .(K-628.)

The Submarine Treaty embraces two articles that are admittedly inconsistent. Senator Root and Mr. Hughes, in the clearest terms, stated that Resolution Article I, which finally became Article I of the treaty, and Resolution Article II, which finally became Article IV of the treaty, were inconsistent. To quote Senator Root again:

> Article I was a statement of existing law; Article II if adopted, would constitute a change from existing law and therefore it was impossible to say that it was not inconsistent. If it were not inconsistent, there would be no change. Article II could not be consistent with Article I and still make a change. (328.)

Later on "Mr. Root said that he had omitted in answering Senator Schanzer's very discriminating question regarding the relations between Articles I and II to say that, of course, if the second article were adopted by all the world, it would supersede Article I. . . ." (332.)

Senator Root and Mr. Hughes both made it clear that Senator Root's Resolution Article I stated international law as it is, and Article II stated it as they wanted it to be. Also that Article II, as then contemplated by them, was to be merely a recommendation, which they hoped all the world would approve. When that future universal ap-

proval had been obtained, it was contemplated that—by further definite action—Article II was to be made a part of international law, and then be binding. (342.)

But Mr. Balfour injected a new proposition. He suggested that Resolution Article II (ultimately treaty Article IV) should be *immediately* adopted by the signatory powers. As a result of Mr. Balfour's suggestion the signatory powers finally signed the treaty with Article IV including the following words:

> . . . . *they now accept that prohibition as henceforth binding as between themselves* [Author's italics] and they invite all other nations to adhere thereto. (888.)

In accomplishing that, British diplomacy obtained a generous half of the loaf of complete abolition of submarines it had previously been denied.

It seems that the full significance of this *immediate* adherence by the signatories was not appreciated by all. In the light of previous explanations by Senator Root and Mr. Hughes Articles I and IV were now inconsistent.

Having the highest authority for the statement that inconsistency exists between two articles of the treaty, it seems to follow that the treaty cannot be a clear guide as it stands. No matter how clear each separate article of the treaty might be, the treaty as a whole cannot be a clear guide if any of those articles are irreconcilable with each other.

Sir John Salmond (Canadian delegate), hit the nail on the head, when he said:

> . . . . the resolutions as they stood were not free from ambiguities and formal defects. . . . . Secondly, the relation between Resolutions I and II did not appear in the text and a verbal explanation by Mr. Root was necessary to explain it. (332.)

But this explanation by Mr. Root was not put into the text of the treaty. Nor was the text accompanied by any official explanatory declaration or statute to clear up the various ambiguities that inspired the questions, largely unanswered, propounded by the various delegates, namely: Senator Schanzer, Sir John Salmond, Lord Lee, and Mr. Hanihara.

Is it not too much to expect that the average submarine commander will have made a detailed analytical study of the proceedings which resulted in the adoption of the treaty? Can a submarine commander be expected to know the answer to questions that the delegates just named found it necessary to ask, particularly when some of their questions have never been answered?

*Opposition to Clarifying Treaty?* There appeared to be some antipathy to an attempt to clarify this treaty. It will be remembered that when Lord Lee asked for "the precise meaning of the term 'commerce destroyer'" he was not completely answered.

Mr. Root said he "thought that if the committee undertook to go into the details of the processes, it would find itself involved in statements which were neither clear nor intelligible to the common mind, etc. . . . ." (371.)

Senator Lodge "thought that when one came to making catalogues one ran a great risk, etc. . . ." (371.)

In this connection one of the twelve Resolutions of the Washington Conference is of special interest. It will be recalled that No. 1 was a "Resolution For a Commission of Jurists to Consider Amendment of Laws of War." (902.)

No. 2, read as follows:

> Resolution Limiting Jurisprudence of Commission of Jurists Provided in Resolution I.
>
> *Resolved*, That it is not the intention of the powers agreeing to the appointment of a commission to consider and report upon the rules of international law respecting new agencies of warfare that the commission shall review or report upon the rules or declarations relating to submarines or the use of noxious gases and chemicals already adopted by the powers in this conference.
>
> Adopted by the Conference on the Limitation of Armament at the Sixth Plenary Session, February 4, 1922. (902.)

From the foregoing considerations it appears that:

(a) The Submarine Treaty contains inconsistent articles.

(b) It contains the term "commerce destroyer," which is undefined, and therefore ambiguous.

(c) The treaty is not, as it stands, a clear guide for a submarine commander.

### What did the Submarine Treaty Finally Stipulate?

Notwithstanding that the Submarine Treaty itself is not a clear guide as it stands, from a study of its evolution, and the explanations given by its proponent, statements

can be made in certain respects as to what it means. In attempting to set forth what the treaty, as illuminated by questions and explanations, does mean, the writer is endeavoring to be uninfluenced by what he thinks the treaty ought to stipulate.

*Article I.* This article is a statement of international law as it is, as declared by the signatory powers.

Even though the treaty is not in effect, this article, declaratory of existing international law, is effective, and binding upon all. This is a principle well recognized by international lawyers, and but two authorities will be cited.

Referring to the Hague Conventions of 1907, which were revisions of those of 1899, Professor Garner writes:

> Nevertheless, insofar as their provisions are merely declaratory of the existing laws and customs of war, they were of course binding independently of the status of the conventions of which they were a part. It was only those provisions which stipulated for the introduction of new rules that were not binding. (M-20.)
>
> . . . . Professor Zitelman of the University of Bonn, who, speaking of the binding effect of the customary rules of law which have been expressly embodied in non-ratified international conventions, remarks that the formal non-validity of such conventions "is scarcely of importance." "For in large measure," he adds, "it was not intended by the conventions to make new law, but rather to formulate the existing law, deciding at the same time questions in dispute and adding improvements. The formal non-validity of a convention is, therefore, no proof that its contents are not valid law, just the same. *A rule is not to be considered invalid because it is formulated in a convention which itself is not formally recognized as in force.*" Nevertheless, he maintained, and very properly, that none of the conventions of 1907, insofar as their provisions were not declaratory of the existing customary law, had any formal validity or binding force. . . . . (M-23-24.)

While Article I has present and general application, that statement is subject to one very important qualification. That qualification follows as a result of Article IV.

Article I is binding upon all nations, but in so far as it implies any rights that are inconsistent with Article IV, it cannot, once the treaty is effective, give any such rights to any of the signatory nations.

The reason is that the signatory nations have signed the treaty, that the treaty includes Article IV, that Article IV is inconsistent with Article I, which it changes, as clearly stated by Messrs. Root and Hughes.

The following comment applies to Article I in its application prior to the coming into effect of the treaty; after that, in its application to non-signatory powers only.

Presumably the clause of Article I which reads:

> A merchant vessel must not be attacked unless it refuse to submit to visit and search after warning, or to proceed as directed after seizure,

implies the same rights as are given affirmatively by Article 45 of U. S. Navy Instructions Governing Maritime Warfare, which reads as follows:

> If the summoned vessel resists or takes to flight she may be pursued and brought to, by forcible measures, if necessary. (N-21.)

Paragraph 2 of Article I was declared by the Italian reservations, which without objection were made a part of the record of the conference, to mean:

> Submarines have the same obligations and the same rights as surface craft. (364.)

This reservation was apparently for the benefit of Italy only, but such special benefit as it may have been was lost to Italy when that nation signed the treaty including Article IV. Italy then stood upon the same plane as the other signatories.

To repeat, once the Submarine Treaty becomes effective, the implied rights of submarines *of enforcing* the right of visit and search of merchant vessels, granted by Article I are denied to all the signatory powers. These rights will, however, still exist for non-signatory powers.

It is hardly necessary to invite attention to the tremendous restriction in the use of submarines by signatory powers which this constitutes.

*Article II.* No comment.

*Article III.* This article was made Article III of the treaty, so that it would immediately follow Article I and II and indicate that the penalties specified were only for breaches of rules already recognized as international law, as specified in Article I. Article III does not, therefore, apply to breaches of Article IV. This point was clearly brought out in the proceedings, but is not clear from the treaty itself. (382-383.)

Two other points were brought out clearly, which a reading of the article itself would also show. The penalties are applicable to "any person in the service of any power." That is, they are not restricted to submarine

personnel, or to sea craft personnel, for that matter. Nor are the penalties restricted to the personnel of the signatory powers, but are applicable to those of any power. This is an interesting extension of penalties to persons not in the general legal sense under the authority of the powers that purport to declare these penalties.

This article has in it the seed of as much trouble as that stormy petrel of maritime warfare, blockade. The reason is to be found in the last two lines, that an offender "may be brought to trial before the civil or military authorities of any power within the jurisdiction of which he may be found." For countries that are die-hards in yielding extra-territoriality in China, and that fought yielding the stipulations in Turkey, this is a large new concession of sovereignty over their nationals to be granted by the signatories to *any and all nations* under conditions that cannot be clearly foreseen.

Upon its face this concession appears reasonable. If any person does violate the laws of common humanity and customs of naval warfare as set forth in Article I there can be no dissent with the proposition that he is bad as a pirate, and deserves the same fate. But the rub comes in the practical application of the rule. Who is to decide when there has been such a violation? Apparently the civil or military authorities of any country. They are given jurisdiction to try such offenders, and presumably will also decide as to whether an offense has been committed. Now the minds of the public in any country, including even the authorities and not excepting the judiciary, are in time of war not as unbiased as they are in time of peace. This is simply a fact of human nature.

At present there is no general concession of right of punishment comparable to this Article III except in the case of piracy or the slave trade. But in those cases the trials will not be wartime trials. The cases would not be tried in a wartime atmosphere, highly charged with feeling, perhaps, even in neutral countries, as the result of exasperation engendered by blockade and seizure of contraband, or alleged contraband. This is a distinct new jeopardy into which the article would precipitate the naval personnel of the signatory powers. And of other powers as well, if they concede the right of the signatories to make such an international statute, a right which seems questionable.

It should be remembered that a reading of the treaty itself does not make it clear that the penalties of Article III are not to be applied under Article IV. And Article IV is not entirely clear.

As the treaty stands, the most comprehensive rights of life and death over their naval personnel are conceded by the signatories to the officials of any country, in the heat of war, under the authority of a treaty containing inconsistent and ambiguous articles, and defying interpretation even by the eminent statesmen who signed it.

*Article IV.* Under Article I has already been discussed the fact that Article IV changes and transcends Article I for the signatories as soon as the treaty shall become effective.

Article IV as it stands could provoke endless arguments. For anyone to attempt to interpret exactly what this article means would be presumption indeed. We have already seen that a considerable number of the delegates sought light upon it which they were never vouchsafed. But there it stands, and under it, befogged as it is, any country in time of war, has the right, so far as this treaty indicates, to bring any person to trial subject to the penalties of Article III. They really haven't that right, as the proceedings show when the treaty was evolved, but so far as can be seen from the treaty itself they have that right. It is too much to expect that the proceedings of the Washington Conference will have been minutely studied by every official, who under this treaty, may have the power of life or death over some poor sailor who was only trying to do his duty.

While there is a good deal of fog as to just what Article IV does involve, some points seem to stand out fairly clearly.

Senator Root said that Article IV "substituted a general prohibition for a detailed prohibition . . . . that contained in Article I." (343.)

In reply to questions as to the meaning of Article IV it will be remembered that Senators Root and Lodge did not wish to attempt to be specific for fear of becoming involved. At least they ran no risk of becoming involved in the noose which threatens their own naval personnel if the latter's interpretation becomes involved and unsatis-

factory to the no less involved official of *any* country.

Mr. Hanihara (Japanese delegate) in asking about the meaning of the term "commerce destroyer" did not receive much information. He made some very important observations, however. He said that he "thought it was also clear that merchant vessels engaged in giving military assistance to the enemy ceased, in fact, to be merchant vessels." (372.)

Any vessel engaged in unneutral service or carrying contraband would in reality be assisting the enemy, as well as vessels directly and actively transporting troops or engaging in military operations. These points contribute to the formation of the fog about Article IV.

Mr. Hanihara said "It seemed apparent that, if the resolution (finally treaty article IV) were adopted, it excluded the use of submarines for purpose of blockade. It did not appear possible to him to use submarines for this purpose in conformity with rule I. Mr. Hanihara then asked if this interpretation were correct." (372.)

Mr. Root said he thought "that the prohibition would apply to submarines attacking or seizing or capturing or destroying merchant vessels under any circumstances so long as the vessel remained a merchant vessel; he also thought it was necessary to have an effective prohibition to have it so apply. . . ." (372.)

Senator Schanzer temporarily dissented, but finally Article IV was adopted with general assent that submarines were thereby debarred from use for blockade.

Two very significant statements, taken together, in their joint effect, are especially worthy of note, and at the risk of repetition, attention is again invited to them. Mr. Hanihara thought it "clear that merchant vessels engaged in giving military assistance to the enemy ceased in fact to be merchant vessels." Senator Root thought the prohibition of Article IV applied "under any circumstances so long as the vessel remained a merchant vessel." (372.)

Where does this take us?

In the light of these comments, as given at the conference by the treaty makers, Article IV would seem to mean:

First, that submarines are debarred from use in blockade.

Second, that submarines are debarred from attacking, seizing, capturing, or destroying merchant vessels that are not engaged in giving military assistance to the enemy.

The big question remaining, as a result of this article, is this:

When does a merchant ship, by reason of its giving military assistance to the enemy, cease to retain its innocent character as a merchant ship? Or, more particularly, what acts shall constitute giving military assistance to the enemy? Many such acts clearly would fall within the prohibition, but there is a wide nebulous zone in which opinions would honestly differ.

A whole gamut of questions arises. It is true, that by Article IV it has been made difficult for a submarine to obtain information of a merchant ship that would throw light upon its true character as an innocent merchantman or a virtual warcraft. But assuming the information be obtained, what effect upon the character of a merchant ship would the following conditions have? Would the merchant ship be sufficiently aiding the enemy to be considered legitimately within the province of the operations of a submarine under Article IV?

(a) Carrying a few soldiers?
(b) Using the radio to help the enemy?
(c) Under the enemy's orders?
(d) Chartered by the enemy?
(e) Owned by the enemy but doing strictly merchantman service?
(f) Attempting to avoid visit and search?
(g) Carrying irregular papers or no papers?
(h) Carrying contraband?
(i) Breaking blockade?
(j) Under enemy convoy?
(k) Armed?
(l) A privateer?

The conundrum therefore is, when is a merchant ship not a merchant ship?

Under existing international law the effect of the foregoing conditions is understood. As a result of many years of experience, illuminated by numerous decisions, the rules have been formulated, and universally recognized. The rules were applicable to submarines, and still are. Inherently, the observance of the well and long-established rules would act to some extent in limitation of submarines. To that no exception could

be taken, for certainly there should be no retrogression in observing the laws of war and of common humanity. Insofar as submarines, by the limitations of their size, or build, or other inherent qualities, could not operate against merchant ships or any other craft with the same careful observance of the laws of war as surface craft, so much were they thereby debarred from operations. Their limitations are inherent ones.

But when an attempt is made to change international law, no matter how well intentioned, in a subject as complicated as maritime warfare, it gives rise to many legitimate questions. Many perplexities must be resolved before the new order of things can work as smoothly as the old. The difficulty in connection with ruthless submarine war was simply that the rules were disregarded. Making new rules will not obviate that difficulty. Making new rules will increase that difficulty, for new rules will be less well understood than the old ones. If the old rules had been honestly observed, as they were by all countries but one, which proves they can be respected, there would never have been any question of attempting to limit the operations of submarines. Breach of law does not require new law, but deterrents against the breach. The final results of the last war are hardly such as to encourage any other country in the future to emulate the example of the one outlaw in submarine warfare.

### What Effect Would the Submarine Treaty Have if it Were in Force?

Assuming that the treaty has been correctly interpreted as far as possible as a result of the study of its evolution, some of the results of its being in force would probably be as follows:

In their policy of submarine building, the signatory powers would take cognizance of the new limitation of the use of submarines as provided by the treaty. Specifically, since the right of submarines to attack is for the signatory powers by the treaty limited to war craft, (or to other vessels that have by their acts assumed the liabilities of war craft), the faster type of submarines would be the ones most needed. Of course auxiliary war craft such as tenders, transports, fuel vessels, and supply craft are no faster than merchant craft, which they essentially are in structure and speed, and would still furnish objectives for the slower types of submarines.

Theoretically, at least, Article IV does not take away the right of submarines to visit and search merchant vessels, as only by such procedure could their innocent character be determined. But the right of visit and search is a wan and pale one, devoid of the right to use force, apparently, unless it is positively known that the vessel concerned is giving or has given military assistance to the enemy. Plainly, it will be difficult for the submarine to know this without visiting and searching. In a word, this theoretical right is like all other rights that carry with them no enforcing provisions. It is no right at all for practical purposes.

There would undoubtedly be many curious effects of this treaty that cannot now be foreseen, as ingenuity developed them under the stress of war. For example, one of the most useful types of scouts would be one that was converted from a merchant craft, or was built to look like a merchant craft. Assuming that the treaty was respected, they would enjoy a peculiar immunity in that no submarine would dare attack them, unless the submarine had the most conclusive evidence that they were war craft.

Submarines could, under the treaty, attack war craft, and could accompany the fleet for that purpose. So far, experience in naval warfare has not shown that submarines actually fill a useful rôle in a fleet engagement. Theoretically they could, however, and in the future, with swift fleet submarines in existence, no doubt will.

Submarines could still be used for scouting, and for that duty for which they are preeminently fitted, patrol duty. However, in this duty they would find their possibilities for usefulness seriously limited, so much so as very largely to nullify their value. They could, it is true, observe, and report their observations. But these observations could not include that extensive class of observations that can only follow when a vessel has the right of visit and search, and the long-established right of attack of a merchant vessel that resists or flees from attempted visit and search. It is not contended that a submarine would supinely have to permit any vessel to resist it forcibly when the submarine attempted a visit. But

if the Submarine Treaty means anything at all, it means that a submarine would have to let a merchantman run away from the submarine's attempted visit, without any attack by the submarine. That is the reason that the delegates decided that the submarine could not be used for blockade duty, for it led either to a violation of the treaty or to an absurdity.

At the risk of repetition, another probable effect of the treaty will be mentioned. Article III, with its new and apparently all-comprehensive jurisdiction for any country to try naval personnel of any country under a treaty that is by no means comprehensible as it stands, is full of the seeds of trouble, leading to reprisals and the involvement of other countries in the war. There will be many questions that are difficult of solution by men of honest intentions and clear, and educated minds, even with treaties as clear as men can make them. But consider the possibilities, with a foggy treaty, embracing new principles, adjudicated by the authorities of a none too enlightened country, which may be laboring under undue influence, or exasperated by the unpleasant jabs of a war on maritime commerce that really includes neutrals in its lists of victims! And it should be borne in mind that the signatories by this treaty expose their naval personnel to this entirely new kind of jeopardy, and their countries to this new kind of entanglements and difficulties. The troublous questions brought up by blockade would seem to be enough without adding to them.

## Does the Submarine Treaty Accord with the Submarine Policy of the United States?

We have seen that the Submarine Treaty limits the operations of submarines to war craft, or vessels having the liabilities of war craft. That it prohibits the use of submarines in blockade. That it prohibits "submarines attacking or seizing or capturing or destroying merchant vessels under any circumstances so long as the vessel remained a merchant vessel." (372.) This protection is somewhat nebulously thrown about both enemy and neutral merchant vessels, presumably whether they be carrying contraband or not. We have seen all this as a result of study of the evolution of the treaty, as set forth in the minutes of the proceedings of the conference.

But more important, if possible, than the foregoing, we have seen that the treaty as it stands is not clear, that it contains admittedly inconsistent articles. We have seen that even a careful study of its evolution, and a consideration of all the questions and answers that accompanied its making, does not entirely clear up the questions that it inspires.

We have seen that the treaty yields our citizens to the judgment of the authorities of any country in time of war, to be tried for their lives under this treaty that contains admittedly inconsistent articles.

We have seen that the advisory committee of the American delegation at the Washington Conference, created, as Mr. Hughes said, "in order that the American delegates might be advised as to public opinion," advised that delegation as follows:

> Unlimited submarine warfare should be abolished. Laws should be drawn up prescribing the methods of procedure of submarines against merchant vessels both neutral and belligerent. These rules should accord with the rules observed by surface craft. . . . . If the submarine is required to operate under the same rules as combatant surface vessels no objection can be raised to its use against merchant vessels. . . . .
>
> The submarine as a man-of-war has a very vital part to play. It has come to stay. . . . .
>
> As a scout the submarine has great possibilities—it is the one type of vessel able to proceed unsupported into distant enemy waters and maintain itself to observe and report enemy movements. . . . . Here again the submarine has come to stay—it has great value, a legitimate use, and no nation can decry its employment in this fashion.
>
> . . . . The retention of a large submarine force may at some future time result in the United States holding its outlying possessions. If these colonies once fall the expenditure of men necessary to recapture them will be tremendous and may result in a drawn war which would really be a United States defeat. The United States needs a large submarine force to protect its interests.
>
> The committee is therefore of the opinion that unlimited warfare by submarines on commerce should be outlawed. The right of visit and search must be exercised by submarines under the same rules as for surface vessels. It does not approve limitation in size of submarines. (813.)

The provisions of the Submarine Treaty are not consistent with the advice of the advisory committee. If we recognize that the advisory committee, chosen by the President to advise the American delegation "as to public opinion," did truly hold a mandate from the American people, then the con-

clusion must follow that the Submarine Treaty is not in accord with the submarine policy of the United States.

### Conclusion

Because the Submarine Treaty was signed by five countries, it cannot be concluded that each of those countries thought the treaty was clear and consistent. In fact, in default of a treaty clearly abolishing the submarine completely, a treaty that somewhat limited the submarine, was acceptable to any country desiring the submarine's abolition.

From the standpoint of such a country, if the limitation were not absolutely clearly defined, this was a virtue rather than a fault. The treaty would limit the submarine some, certainly, and just as far as the treaty's interpretation could be made to extend.

Already the United State has seen its naval armament limited not only by what a treaty stipulated, but also by what another signatory said the treaty stipulated although the United States did not agree in that interpretation. This reference is of course to the question of battleship turret gun elevations. Apparently the United States is so sensitive to the rights of others that it accepts not only the limitations of a treaty, but also the limitations of an unacceptable interpretation. This being so, the United States should not bind itself by any treaty that is not clear, least of all by one that embodies frankly inconsistent articles.

Once more Great Britain showed the quality of its diplomacy. It had proposed the abolition of the submarine. In that it was thwarted. Then by a flank movement, but an open and a fair one, it obtained a great deal that its frontal attack had failed to accomplish. It obtained the abolition of the use of submarines by the signatory powers in all operations against merchant ships, if and when the treaty becomes effective. This abolition includes not only illegitimate operations, but those that until the making of this treaty were admitted by all to be legitimate.

Therein may lie the reason why the Submarine Treaty is the only one of the Washington Conference treaties not yet ratified by all the signatories. But whether it is ever to be fully ratified and made effective, we may be sure that the question of submarines and their uses will again arise. And if this treaty be not ratified, the surer will the question of submarines be again brought up for action.

The submarine's legitimate field of usefulness should be preserved. The safety of United States citizens should not be wantonly jeopardized. Foreign entanglements should be avoided.

Therefore the problem of the submarine should be carefully considered. The policy of the United States in that connection if there is to be a change, should be determined in advance. If the United States, for what may seem good reasons, is to yield something, it should be a considered and intentional act. Careful advance consideration should be given. Any treaty to which the United States sets its hand should be clear and consistent, with its implications fully understood at the time, and in accord with the wishes of the citizens of the United States.

It is well that the Submarine Treaty as now written is not in effect. In not ratifying that treaty France has done a service to the United States, and to the world at large.

### Appendix

*List of References.*

| *Reference Letter* | *Book or Document* |
|---|---|
| A | Senate Document No. 126. 67th Congress 2d Session 1921-1922. Conference on the Limitation of Armament. Government Printing Office, Washington, 1922. |
| B | *"Navy Yearbook 1920 and 1921."* Senate Document No. 428, 66th Congress, 3d Session. Washington, Government Printing Office, 1922. |
| C | *"Annual Reports of the Navy Department"* 1922. Washington, Government Printing Office, 1923. |
| D | Pamphlet No. 69. *"Report of a Special Board appointed by the Secretary of the Navy With Reference to the Upkeep of the Navy In Its Various Branches."* Navy Department, Washington, file 3809-1237, dated 17 January, 1925. |

(Continued on page 126)

# *An* Unusual Picture *of* Washington

*By* LIEUTENANT COMMANDER (RETIRED) S. L. H. HAZARD, *U. S. Navy*

ONE DAY while "antiquing" in West Chester, Pennsylvania, I spotted the old steel engraving of George Washington that is reproduced with this article.

As soon as I saw this picture I noticed that it was very different from any other portrait of our first commander-in-chief that I had ever seen, especially in that the expression is grim and the left corner of the mouth is drawn down, apparently by a scar.

I was struck by the difference between this grim, dour, beady-eyed old man and the usual pictures which show him as a younger man, handsome, dapper, aristocratic, forceful and usually stern but never as this portrait shows him.

On closer examination, I was able to decipher the notes on the engraving, the wording of the certificate under the picture and the significance of the regalia that Washington is wearing.

The engraved legend reads as follows:—

WASHINGTON

ENGRAVED FROM THE PORTRAIT, PAINTED FROM LIFE BY WILLIAMS, FOR ALEXANDRIA WASHINGTON LODGE NO. 22

VIRGINIA, 1794

The written certificate reads as follows:—

This engraving is from a photograph of the portrait of General Washington painted from life by Williams for the Alexandria (Va.) Washington Lodge, and now in its possession.

The original was discovered by Sidney Hayden, Esq., in his researches for his work entitled, "Washington and his Masonic compeers." Mr. Hayden himself vouches for the genuineness of this copy from the original and signs his name here in witness thereof.

SIDNEY HAYDEN

Sayre, Pa., March 1, 1888.

The regalia is that of a Grand Master of a Masonic grand lodge.

The engraving is old, soiled and discolored, and to the dealer who had it, it was just that and nothing more. The certificate meant nothing to him but the autograph of one of the great American historians of Free Masonry greatly enhanced the masonic value of the picture and the idea occurred to me to buy it and present it to Samuel D. Sherwood Lodge, Springfield, Massachusetts.

Before sending the engraving away, as I wanted a copy for myself, I took it to Mr. J. W. Replogle, the yard photographer, at the navy yard, Philadelphia, and he made an excellent negative from it, even clearer than the copy I furnished.

Since the portrait came into my possession I have heard a rather interesting bit of gossip about it which I have not been in a position to verify. One man who has visited the Alexandria lodge told me that the engraving has slighted one noticeable feature of the original which shows a long scar running diagonally from the left cheek across the corner of the mouth and toward the chin which draws the mouth badly out of shape on the left side. This is much at variance with any other picture of Washington that I have ever seen nor can I recall any descriptions of the first president in which this is mentioned. However, I believe this scar must have existed or it would not have been delineated. It must not be forgotten that this portrait was painted for his brethren in the lodge and as such might probably have not been expected to reach the general public.

The story of the origin of this portrait gives a rather interesting sidelight on conditions affecting Washington after the Revolution and his reaction to one phase of them. The later history of the portrait is also worth recording.

As the story goes, immediately after the Revolution, Washington was besieged by artists of all kinds with requests that he sit for his portrait, these pictures to adorn

WASHINGTON
This engraving is from a photograph of the portrait of Genl Washington painted from life by Williams for the Alexandria Va Washington Lodge and now in its possession.
The original was discovered by Sidney Hayden Esq. in his researches for his work entitled: Washington and his Masonic compeers. Mr Hayden himself vouches for the genuineness of this copy from the original and signs his name here in evidence thereof.
Joppa Md.
March 1st 1888.
Sidney Hayden

EDITOR'S NOTE: Compare this picture with the one of Washington, pages 126-127.

private homes, or to be copied for publication and circulation, or to be used by any and all sorts of societies, associations, &c., whether reputable or not. Washington soon got "fed up" on these requests and took the stand that he would only sit for artists of great prominence or for artists accredited by well-known, well-established, reputable organizations.

William Williams was rather an obscure artist who had frequently requested sittings and had been refused. But as he was most anxious to paint Washington's portrait, he decided to make a different approach. Washington's Masonic activity and zeal were well known and Williams persuaded the officers of Washington's lodge, Alexandria Lodge No. 22, to ask him to sit for his portrait as a gift to the lodge and only under these conditions would he agree. And Williams saw to it that he was the man to paint this portrait.

The portrait was painted and presented to the lodge. But for some reason not known now, whether because it was a poor likeness or what not, the picture was hung on the wall behind the master's station up near the ceiling in a dark unlighted corner and was neglected, becoming badly dimmed with age and smoke from the candles, oil lamps, etc., used for illumination.

When Hayden was making his researches, he "discovered" the portrait and it was cleaned and hung in a much better place of honor. Hayden was permitted to photograph the picture in order to make this steel engraving for use as a frontispiece to his book on Washington as a Mason.

Since its "resurrection," Alexandria lodge has received many requests to allow copies to be made in oils of this portrait, but I believe these generally were refused. The Museum and Library of the Grand Lodge of Pennsylvania was especially anxious to get a copy of the portrait and after many refusals hit upon the plan of having Miss Fanny M. Burke, a great granddaughter of Thomas Jefferson and a very popular and well-known artist of Washington, ask to make a copy of the portrait. The officers could refuse every one else but not Miss Burke and her copy, made in 1910, now hangs in a place of honor in the Masonic Museum in Philadelphia.

Except for the "Fanny Burke" copy and the "Hayden" copy, so named by me, there have apparently been no other copies of this portrait made as the Philadelphia Museum has only these two on their walls.

Another informant told me that the Alexandria Lodge has been offered a very great price, well above $100,000, for the original but have refused to sell it at any figure.

# Comparative Naval Data *for* Treaty Navies

*(Correct as of 1 October, 1926.)*

Comparison based on ratio of tonnage for capital ships established by Washington Conference Treaties for Limitation of Naval Armament.

TABLE I—PERSONNEL (Unlimited).

| POWER | REGULAR ESTABLISHMENT (INCLUDING THOSE OF DOMINIONS) (X) | | REGULAR ESTABLISHMENT ON BASIS OF 5–5–3–1.67–1.67 RATIO WITH BRITISH EMPIRE | | INCREMENT NECESSARY TO ATTAIN THE 5–5–3–1.67–1.67 IN REGULAR ESTABLISHMENT | | ACTUAL RESERVE PERSONNEL | |
|---|---|---|---|---|---|---|---|---|
| | OFFICERS | MEN | OFFICERS | MEN | OFFICERS | MEN | OFFICERS | MEN |
| UNITED STATES | 8,531 | 82,910 | 9,302 | 95,835 | 771 | 12,925 | 5,176(e) | 27,026(e) |
| BRITISH EMPIRE | 9,302(a) (b) | 95,835(a) | 9,302 | 95,835 | None | | 10,798(f) | 65,342(f) |
| JAPANESE EMPIRE | 7,703(c) | 68,338(c) | 5,581 | 57,501 | None | | 3,464 | 40,388 |
| FRANCE | 3,570(d) | 53,000(d) | 3,107 | 32,009 | None | | 9,172 | 154,000 |
| ITALY | 2,710 | 40,124 | 3,107 | 32,009 | 397 | none | 4,729 | 60,000 |

a) Includes an estimated total of 306 officers and 2,795 men of royal air force performing naval aviation duties. The royal air force is a separate department, ranking with the army and the navy, and had 3,447 officers including 103 cadets, 28,560 airmen and 9,804 civilians and natives on August 31, 1926. Since in the United States, Japan, and France naval aviation personnel forms an integral part of the navy, it seems only fair that the personnel of the British air force performing duties in connection with naval aviation should be classed in this comparison. Includes 4,154 merchant marine personnel paid by naval appropriations manning auxiliaries such as tankers, yard craft, hospital ships, fleet service tugs, etc., which are manned in the United States and other navies by regular officers and enlisted personnel except that an average of 100 civilians are employed under the U. S. Navy Department for yard craft, ferry service, barges and lighters.

b) Does not include 188 cadets undergoing training in battleships and battle cruisers. Does include 125 naval constructors and 75 civil engineers. Naval constructors and civil engineers do not hold commissions in the British Navy but perform duties similar to those of naval constructors and civil engineers, United States Navy.

c) Figures as of July 1, 1926. There were 675 officers and 6,100 men in Japanese naval aviation on September 1, 1926.

d) French total includes 218 officers and 3,650 men in naval aviation.

e) Includes 1,535 retired officers of all ages and 335 retired enlisted men under 55 years of age.

f) Includes 7,481 retired officers and pensioners of all ages and 18,502 retired enlisted men under 55 years of age.

X) Above figures do not include marine corps personnel. The United States has 1,190 officers and 17,877 men in the marine corps of which 64 officers and 2,177 men serve afloat. The British Empire has 423 officers and 10,350 men in the royal marines, of whom 157 officers and 5,085 enlisted men serve afloat. Japan has no force corresponding to the marine corps of the United States and the British Empire.

| ACTUAL RATIOS | U. S. | BRIT. EMP. | JAP. EMP. | FRANCE | ITALY |
|---|---|---|---|---|---|
| OFFICERS, REGULAR ESTABLISHMENT | 4.58 | 5.00 | 4.14 | 1.91 | 1.46 |
| ENLISTED MEN | 4.33 | 5.00 | 3.56 | 2.76 | 2.09 |
| RATIO APPLIED TO CAPITAL SHIPS BY TREATY | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

TABLE II—CAPITAL SHIPS (Limited).

| POWER | BUILT | | BUILDING | | TONNAGE TO BE ARRIVED AT IN 1941 | TRUE RATIO IN 1941 |
|---|---|---|---|---|---|---|
| | No. | TONS | No. | TONS | | |
| UNITED STATES | 18 | 525,850 | None | | 525,000 | 5.00 |
| BRITISH EMPIRE | 22(a) | 580,450 | 2(a) | 70,000 | 525,000 | 5.00 |
| JAPANESE EMPIRE | 10 | 301,320 | none | | 315,000 | 3.00 |
| FRANCE | 9 | 194,544 | none | | 175,000 | 1.67 |
| ITALY | 7 | 133,670 | None | | 175,000 | 1.67 |

a) *Nelson* and *Rodney* building to replace *Ajax, Centurion, King George V*, and *Thunderer*. When this replacement is effected capital ship tonnage for British Empire will be (20 ships) 558,950 tons.

X) British Empire and Japanese Empire retain four battle cruisers each, United States retaining none. When *Nelson* and *Rodney* are completed, the following status will obtain:

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| Capital Ships; Armed With 13.4-Inch Guns or Heavier | 14 | 20 | 10 | 3 | 0 |
| Capital Ships; Armed With 12-Inch Guns | 4 | 0 | 0 | 6 | 7 |

Following the Washington Conference Treaties for Limitation of Naval Armament the following capital ships were scrapped:

TABLE III—(Scrapped under Treaty Terms).

| Power | Ships Completed | | Ships Building | | Total | |
|---|---|---|---|---|---|---|
| | No. | Tons | No. | Tons | No. | Tons |
| United States | 19(a) | 289,580 | 13(b) | 552,800 | 32 | 842,380 |
| British Empire | 22(c) | 447,750 | None | | 22(e) | 447,750 |
| Japanese Empire | 12(d) | 192,751 | 4 | 161,958 | 16 | 354,709 |
| France | None | | None | | None | |
| Italy | None | | None | | None | |

a) Includes *Oregon* and *Illinois* permitted to be retained for non-combatant purposes.
b) Includes *Lexington* and *Saratoga* which are being completed as aircraft carriers.
c) Includes *Collingwood* and *Colussus* permitted to be retained for non-combatant purposes.
d) Includes *Asahi* and *Shikishima* permitted to be retained for non-combatant purposes.

TABLE IV—AIRCRAFT CARRIERS (Limited).

| Power | Built (a) | | Building | | Totals | | Totals of Non-Experimental Carriers | | Total Tonnage Allowed by Treaty | Increment Necessary to Attain Allowance (f) |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Tons | No. | Tons | No. | Tons | No. | Tons | | Tons |
| United States | 1 | 12,700 | 2(b) | 66,000 | 3 | 78,700 | 2 | 66,000 | 135,000 | 69,000 |
| British Empire | 4 | 67,290 | 2(c) | 37,200 | 6 | 104,490 | 3 | 56,300 | 135,000 | 78,700 |
| Japanese Empire | 1 | 9,500 | 2(d) | 53,800 | 3 | 63,300 | 2 | 53,800 | 81,000 | 27,200 |
| France | None | | 1(e) | 21,160 | 1 | 21,160 | 1 | 21,160 | 60,000 | 38,840 |
| Italy | None | | None | | None | | None | | 60,000 | 60,000 |

a) All experimental with exception of British carrier *Furious* of 19,100 tons, completed September, 1925. Under terms of treaty, experimental carriers may be replaced at any time, provided total carrier tonnage is not exceeded.
b) *Lexington* and *Saratoga*, which were building as battle cruisers, are being completed as aircraft carriers.
c) *Courageous* and *Glorious*. Does not include one seaplane carrier building in Australia.
d) *Akagi* formerly building as battle cruiser; *Kaga*, formerly building as battleship.
e) *Bearn*, ex-battleship.
f) Maximum individual allowed tonnage of aircraft carriers is 27,000 tons. Most powers favor smaller carriers than this. General board of United States Navy recommended in 1925 immediate construction of one 23,000 ton carrier.

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| Actual Ratio, Aircraft Carriers Built and Building Tons | 2.91 | 3.87 | 2.35 | 0.78 | 0.00 |
| Allowed Ratio, Aircraft Carriers (Tons) | 5.00 | 5.00 | 3.00 | 2.22 | 2.22 |

TABLE V—MODERN CRUISERS (Unlimited)
5-INCH TO 8-INCH GUNS: 3,000–10,000 TONS; 27 KNOTS PLUS.

| Power | Built | | Building | | Authorized and Appropriated for | | Total | | Tonnage on Basis of 5–5–3–1.67–1.67 | To Attain 5–5–3–1.67–1.67 Ratio With Britain | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Tons | No. | Tons | No. | Tons | No. | Tons | | No. (a) | Tons |
| United States | 10 | 75,000 | 2 | 20,000 | 3 | 30,000 | 15 | 125,000 | 332,290 | 21 | 207,290 |
| British Empire | 40 | 194,290 | 11(b) | 110,000 | 3 | 28,000 | 54 | 332,290 | 332,290 | None | |
| Japanese Empire | 19 | 102,005 | 6 | 54,200 | None | | 25 | 156,205 | 199,374 | 4 | 43,169 |
| France | 3 | 16,731 | 6(c) | 53,619 | 1 | 10,000 | 10 | 80,350 | 110,985 | 3 | 30,635 |
| Italy | 8 | 30,784 | 2 | 20,000 | None | | 10 | 50,784 | 110,985 | 6 | 60,201 |

a) Number obtained by dividing tonnage by 10,000 tons, the maximum size cruiser allowed by treaty.
b) Does not include one mine layer, first line, of 6,740 tons with modern cruiser characteristics.
c) Does not include one mine layer, first line, of 4,000 tons with modern cruiser characteristics.

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| ACTUAL RATIOS, MODERN CRUISERS | | | | | |
| TONNAGE | 1.88 | 5.00 | 2.35 | 1.20 | 0.76 |
| NO. VESSELS | 1.38 | 5.00 | 2.31 | 0.93 | 0.93 |
| CAPITAL SHIP RATIO | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

## TABLE VI—DESTROYER TYPE, FIRST LINE (Unlimited)

| POWER | BUILT | | | | AUTHORIZED AND APPROPRIATED FOR, OR BUILDING | | | | TOTALS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Leaders* | | *Destroyers* | | *Leaders* | | *Destroyers* | | *Leaders* | | *Destroyers* | |
| | No. | Tons | No. | Tons | No. | Tons | No. | Tons | No. | Tons | No. | Tons |
| UNITED STATES | None | | 276(a) | 329,153 | None | | None | | None | | 276 | 329,153 |
| BRITISH EMPIRE | 18(b) | 31,310 | 169(b) | 194,575 | None | | 2 | 2,540 | 18 | 31,310 | 171 | 197,115 |
| JAPANESE EMPIRE | None | | 78 | 85,650 | 4 | 7,400 | 14 | 20,230 | 4 | 7,400 | 92 | 105,880 |
| FRANCE | 4 | 9,144 | 20 | 20,062 | 9 | 22,647 | 25 | 36,560 | 13 | 31,791 | 45 | 56,622 |
| ITALY | 8 | 14,88- | 20 | 18,111 | None | | 15 | 19,112 | 8 | 14,889 | 35 | 37,223 |

CHARACTERISTICS: *Destroyer Leaders*, 1,500 tons plus; 27 knots plus: *Destroyers first line*, 800–1,500 tons; 27 knots plus

a) Includes fourteen light mine layers, destroyer type, nearly all of these 276 boats which give the U. S. a preponderance in this type, were laid down during the World War in an emergency program to combat the German submarines; many of them are of hasty construction. Only 106 destroyers and six mine layers, total 112, are kept in commission.
b) Includes one mine layer.

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| ACTUAL RATIOS, MODERN DESTROYER TYPES | | | | | |
| TOTAL COMBINED TONNAGE | 7.29 | 5.00 | 2.48 | 1.93 | 1.14 |
| TOTAL COMBINED NO. VESSELS | 7.30 | 5.00 | 2.54 | 1.54 | 1.14 |
| CAPITAL SHIP RATIO | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

## TABLE VII—FLEET SUBMARINES, FIRST LINE (Unlimited)

### OVER 1,000 TONS EACH; 20 KNOTS PLUS

| POWER | BUILT | | AUTHORIZED AND APPROPRIATED FOR, OR BUILDING | | TOTALS | | TONNAGE ON BASIS OF 5–5–3–1.67–1.67. | TO ATTAIN THE 5–5–3–1.67–1.67 RATIO WITH BRITISH EMPIRE | |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Tons | No. | Tons | No. | Tons | | No. (e) | Tons |
| UNITED STATES | 6(a) | 9,675(a) | 3 | (b) | 9 | 15,675(d) | 23,565 | 4 | 7,890 |
| BRITISH EMPIRE | 7(c) | 11,350 | 9 | 12,215 | 16 | 23,565 | 23,565 | None | |
| JAPANESE EMPIRE | 6 | 10,110 | 17 | 21,970 | 23 | 32,080 | 14,139 | None | |
| FRANCE | 3 | 2,988 | 4 | 10,010 | 7 | 12,998 | 7,870 | None | |
| ITALY | None | | 4 | 5,200 | 4 | 5,200 | 7,870 | 1 | 2,670 |

a) Includes *T–1*, *T–2*, and *T–3*, out of commission.
b) Tonnage not available; includes one mine-laying submarine and two cruiser submarines, all V-types.
c) Does not include two 1,600-ton monitor submarines.
d) Estimated on average basis of 2,000 tons per ship for ships building.
e) Number arrived at by assuming an arbitrary boat tonnage of 2,000 tons.

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| ACTUAL RATIOS FLEET SUBMARINES | | | | | |
| TONNAGE | 3.32 | 5.00 | 6.81 | 2.76 | 1.10 |
| NUMBER VESSELS | 2.81 | 5.00 | 7.19 | 2.19 | 1.25 |
| CAPITAL SHIP RATIO | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

## Table VIII—Submarines, First Line
### 700 Tons Plus, 13 Knots Plus (Unlimited)

| Power | Built | | Authorized and Appropriated for, or Building | | Totals | | Tonnage on Basis of 5–5–3–1.67–1.67. | To Attain the 5–5–3–1.67–1.67 Ratio With British Empire | |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Tons | No. | Tons | No. | Tons | | No. | Tons |
| United States | 50 | 43,822 | None | | 50 | 43,822 | 26,040 | None | |
| British Empire | 28(a) | 25,150 | 1 | 890 | 29 | 26,040 | 26,040 | None | |
| Japanese Empire | 43 | 34,834 | 2 | 1,663 | 45 | 36,497 | 15,624 | None | |
| France | 19(b) | 17,509 | 19(c) | 26,621 | 38 | 44,130 | 8,697 | None | |
| Italy | 9 | 7,167 | 9 | 7,145 | 18 | 14,312 | 8,697 | None | |

a) Does not include two 1,600-ton monitor submarines. Does not include three mine layers totalling 2,670 tons.
b) Does not include three mine layers totalling 6,760 tons.

| Actual Ratios, Submarines, First Line | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| Tonnage | 8.41 | 5.00 | 7.00 | 8.47 | 2.75 |
| Number of Vessels | 8.62 | 5.00 | 7.76 | 6.55 | 3.10 |
| Capital Ship Ratio | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

## Table IX

### *A. Naval Air Strength (Unlimited)*

Data on Plane Carrying Capacity of Fleets. The following table indicates the airplanes which it is estimated may be carried and launched for effective attack by combatant ships of the fleets at sea, away from a coast defense area of 1,000 miles.

| Nation | Plane Carrying Capacity—Built | | Plane Carrying Capacity—Building | | Total | Plane Carrying Capacity on Basis of 5–5–3–1.67–1.67 | To Attain the 5–5–3–1.67–1.67 Ratio Capacity With British Empire |
|---|---|---|---|---|---|---|---|
| | Aircraft Carriers | Battleships and Cruisers | Aircraft Carriers | Battleships and Cruisers | | | |
| United States | 30 | 46 | 144 | 10(c) | 230 | 291 | 61 |
| British Empire | 93 | 6(a) | 144 | 48 | 291 | 291 | None |
| Japanese Empire | 12 | 30 | 144 | 12 | 198 | 175 | None |
| France | 0 | 27 | 60 | 12 | 99 | 97 | None |
| Italy | 0 | 30 | 0 | 4 | 34 | 97 | 63 |

a) Carrying capacity of *Vindictive*, only British ship (battleship or cruiser), having planes. Planes and platforms on vessels were removed after the World War; platforms are kept in storage, and in a short time carrying capacity of battleships and cruisers would be brought to 120.
b) Possible to attain capacity by (1) building large aircraft carriers to total tonnage allowed by treaty; (2) building cruisers to carry planes, cruisers not being limited as to numbers; and (3) building carriers of less than 10,000 tons displacement, these not being limited by treaty.
c) Includes capacity of three battleships being reconditioned.

| | U. S. | Brit. Emp. | Jap. Emp. | France | Italy |
|---|---|---|---|---|---|
| Plane Carrying Capacity | 3.95 | 5.00 | 3.40 | 1.70 | 0.58 |
| Capital Ship Ratio | 5.00 | 5.00 | 3.00 | 1.67 | 1.67 |

### *B. General Data Regarding Naval Aviation*

| | UNITED STATES | BRITISH EMPIRE | JAPANESE EMPIRE | FRANCE | ITALY |
|---|---|---|---|---|---|
| Heavier-than-Air craft exclusive of School and Training | 212 | 120(b) | 193 | 90 | 175 |
| Heavier-than-Air craft in Reserve | 125 | 120 | 236 | 59 | (e) |
| Personnel: Officers | 692(c) | 456(d) | 675 | 218 | (e) |
| Enlisted Men | 3,587(c) | 3,215(d) | 6,100 | 3,650 | (e) |
| Reserve | 470 | (e) | None | 1,475 | (e) |
| Lighter-than-Air craft— | | | | | |
| Built | 2(a) | 2 | 2 | 5(f) | 3 |
| Authorized | 2 | 2 | None | 26 | 5 |

a) Includes the non-military rigid *Los Angeles*.
b) Approximately 500 additional planes in general service in royal air service.
c) Includes marine corps personnel.
d) Does not include administrative and other overhead personnel of the royal air force which serves the fleet air arm, and therefore is not accurate for basis of comparison. An estimate of personnel required by the British Empire for naval aviation is 1,050 officers and 9,000 men.
e) Information not available.
f) The French report that the *Mediterranean* is to be scrapped this year. Besides the *Mediterranean* they report having 13 non-rigid dirigibles of 360,000 cubic feet capacity; of these, four are in commission and 9 in reserve.

### TABLE X—VESSELS LAID DOWN OR APPROPRIATED FOR SINCE WASHINGTON LIMITATION CONFERENCE, 6 FEBRUARY, 1922.

| TYPE | UNITED STATES | | | BRITISH EMPIRE | | | JAPANESE EMPIRE | | | FRANCE | | | ITALY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Laid Down | Appro. for | Total | Laid Down | Appro. for | Total | Laid Down | Appro. for | Total | Laid Down | Appro. for | Total | Laid Down | Appro. for | Total |
| Battleships | | | | 2 | | 2 | | | | | | | | | |
| Aircraft carriers first line | 2(a) | | 2 | 2(b) | | 2 | 2(c) | | 2 | 1 | | 1 | | | 2 |
| Light (Modern) Cruisers first line | 2 | 3 | 5 | 11(d) | 3 | 14 | 12 | | 12 | 6 | 1 | 7 | 2 | | |
| Cruiser mine layers | | | | 1 | | 1 | | | | 1 | | 1 | | | |
| Destroyer leaders | | | | | | | | 4 | 4 | 6 | 3 | 9 | | | |
| Destroyers | | | | 2 | | 2 | 35 | 8 | 43 | 21 | 4 | 25 | 16 | | 16 |
| Submarines (all classes) | 3 | | 3 | 4 | 6 | 10 | 30 | 9 | 39 | 28 | 11 | 39 | 13 | | 13 |
| Gunboats | 6 | | 6 | 4 | | 4 | 4(e) | | 4 | | 1 | 1 | | | |
| Mine sweepers | | | | | | | 6 | | 6 | | | | 9(g) | | 9 |
| Submarine tenders | | | | | 1 | 1 | 2 | | 2 | 1 | 1 | 2 | | | |
| Tankers | | | | | | | 3 | | 3 | 1 | 2 | 3 | 4 | | 4 |
| Supply Ships | | | | | 1 | 1 | 1 | | 1 | | | | 2 | | 2 |
| Totals | | | 16 | | | 37 | | | 116 | | | 88 | | | 46 |

a) *Lexington* and *Saratoga*.
b) *Courageous* and *Glorious*
c) *Akagi* and *Kaga*.
d) *Emerald* and *Enterprise* were laid down prior to conference and are not included.
e) River gunboats.
f) No definite information concerning building program.
g) Both mine sweepers and mine layers.

## TABLE XI—MERCHANT MARINE OF CHIEF NATIONS—1,000 TONS AND ABOVE GROSS TONNAGE. (1 July, 1926)

Merchant ships though not an active part of peacetime navies, are a vital part of wartime navies. The fact that Merchant vessels constitute a powerful naval reserve is often overlooked.

| MERCHANT VESSELS | UNITED STATES | | BRITISH EMPIRE | | JAPAN | | FRANCE | | ITALY | | GERMANY | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | TONNAGE (a) | No. | TONNAGE | No. | TONNAGE | No | TONNAGE | No. | TONNAGE | No. | TONNAGE |
| Total..... | 2,299 | 11,089,753 | 4,473 | 20,184,154 | 990 | 3,583,839 | 746 | 3,099,803 | 672 | 3,000,855 | 678 | 2,600,347 |
| Laid Up .... | 842 | 3,757,083 | 239 | 1,203,697 | 35(b) | 53,270 | 42 | 91,713 | 30(c) | 35,52 1 | No data available. | |

a) Shipping on Great Lakes not included.
b) Figures are of November, 1925.
c) Figures are of March, 1926.

### CLASSIFIED AS TO SPEED, 12 KNOTS AND ABOVE (gross tonnage of ships of 1,000 plus)

| | UNITED STATES | BRITISH EMPIRE | JAPAN | FRANCE | ITALY | GERMANY |
|---|---|---|---|---|---|---|
| 12–15 knots..... | 882,960 | 5,537,242 | 746,348 | 657,041 | 506,631 | 636,803 |
| 15–18 knots..... | 611,067 | 2,109,820 | 164,888 | 219,760 | 183,817 | 96,279 |
| 18–20 knots..... | 62,140 | 560,486 | 10,527 | 67,225 | 51,917 | 52,930 |
| Over 20 knots..... | 113,683 | 235,995 | | 69,506 | 81,700 | |
| TOTALS..... | 16,698,50 | 8,443,543 | 921,763 | 1,013,532 | 824,065 | 786,012 |

# Discussion

***Modern Methods in Sea and Air Navigation***

(See Page 17, January, 1927, PROCEEDINGS)

COMMANDER ARCHER M. R. ALLEN U.S. NAVY—I consider this the best article on the subject of navigation published in recent years. It represents as the author states, twenty-four years of patient labor and a careful study of the best books on the subject found throughout the civilized world, dating back to the time of Columbus.

Commander Aquino's tables have been in practical use in our service since their publication about 1908. I believe they were first used by Rear Admiral Marvell on the midshipmen's practice cruise in 1910, and he found them so satisfactory that he recommended them highly as indicated by his comments published in the Naval Institute PROCEEDINGS in 1913, quoted below:

"The method of Aquino shown is in the writer's opinion the best of any that have been published."

Two other senior officers commented favorably on them in the discussions of the Institute at that time.

"The 'Newest' Navigation Altitude and Azimuth Tables by Lieutenant (now Commander) Aquino of the Brazilian Navy are all that the author claims for them 'The Simplest and Readiest in Solution.'

"I have been using Aquino's tables for some time and I have found them sufficiently accurate for all practical purposes and preferable to all other methods for the following reasons:

"1. The chances of error are very small.

"2. The facility of solution.

"3. The easiness with which error may be detected."

REAR ADMIRAL C. C. BLOCH, U.S.N.

"Those navigators with whom I am acquainted and who have used Radler de Aquino's method are greatly in favor of it and work all their lines of position by the use of his tables."

CAPTAIN W. R. GHERARDI, U.S.N.

Since then many navigators in the naval service have used them; always, as far as I have been able to ascertain, with the greatest satisfaction. In fact they are now in use or have been for the past two years by the navigator of the flagship of the scouting fleet who speaks very highly of them. I have used them myself for the past twelve years with excellent results and have compared them wherever possible with other methods. I thoroughly agree with Admiral Bloch in his comments and feel that the time has come not only to recommend them in the highest terms to the service at large, but even to recommend that they be included in the course of study at the Naval Academy.

The mathematical time comparison of this type of solution with others shows the following results:

| *Tables* | *Books* | *Figures* | *Openings* | | *Time* |
|---|---|---|---|---|---|
| Aquino ..... | 2 | 216 | 6 | 6 | minutes. |
| H.O. 203-204 .... | 3 | 241 | 4 | 6 | minutes. |
| *H.O. 201 ..... | 2 | 234 | 4 | 6 | minutes. |
| Versine ..... | 4 | 253 | 11 | 7 | minutes. |
| Cosine Haversine . | 4 | 388 | 11 | 9.5 | minutes. |
| Time Sight ..... | 4 | 385 | 8 | 15.5 | minutes. |
| Martelli ..... | 4 | 244 | 9 | 8.5 | minutes. |

*limited to 24° same or contrary declination.

The books indicated above are:

1. The *Nautical Almanac.*
2. The Tables used.
3. The Azimuth Tables O-23.
4. The Azimuth Tables 23-45.

The above table indicates that Aquino's system is just as short as any other. In addition it enables the navigator to use one standard method for all solutions except the one on the meridian. The advantage of this can only be fully realized by navigators who have had much of this work to do. Also it is a method which lends itself readily to an accurate solution under the usual conditions

of work in the chart house at sea while a continuous extraneous conversation is being carried on, a feature which must be experienced to be fully appreciated.

In view of the recent caution against the use of H.O. 203 within an hour of meridian a careful test has just been carried out at the Naval Academy which shows that Aquino's tables are thoroughly reliable for solutions right up to meridian and are not subject to the same difficulty. Also, in view of the possible error in the "reduction to meridian method" it is believed that Aquino should be used in place of that time honored system.

The writer, who has had considerable radio experience, believed at one time that directional radio would eventually supplant celo-navigation but the difficulties involved seem to indicate that it will be at least another generation before such a development can become general and it is therefore certain that we will for many years, be dependent on the ability of trained navigators to conduct ships and aircraft safely on long voyages. This being the case, it seems vitally necessary that we should strive continually to improve our methods. Accuracy comes more readily with ease of solution and the present tendency to avoid the useless detour through logarithms and out again is clearly shown in the modern navigational tables published in many countries. Not only have our own tables H.O. 203 and 204 come out in recent years but the Japanese and Portugese have also just gotten out tables of this type in addition to the many others published during the last century, such as Ball's.

It is to be hoped that this article will stimulate discussion of the various methods available and lead more of our navigators to adopt Aquino's method which I firmly believe to be as the author claims "the simplest and readiest in solution."

### *Rear Admiral Robley Dunglison Evans, U.S.N.*

(See page 2197, November, 1926, PROCEEDINGS)

CAPTAIN H. A. BALDRIDGE, U.S. NAVY.—The editor was a midshipman on his two-year cruise, serving in the U.S.S. *Kentucky* in 1902-04 when Admiral Evans was flying his flag as commander-in-chief of the Asiatic fleet. When the junior officers' mess paid its first official call on Admiral Evans, the latter told us the following interesting story. The Editor re-told the story, and it was first published in *The Trident* in October, 1925:

THE GERMAN PRINCE AND THE TORCHLIGHT PROCESSION.

[As told at a dinner upon the close of the first aviation course at Annapolis.]

You remember back during the Spanish War the way that German Admiral tried to bluff Dewey after the battle of Manila Bay? He didn't get away with it, of course, but his actions did arouse considerable hostile sentiment among the American public. This was not pleasing to Kaiser Wilhelm. So, a couple of years later, in 1901, he sent his brother, Prince Henry of Prussia, over to America on a little friendly call to attempt to smooth down our ruffled feathers. So there was a big how-de-do among the diplomats and the German-Americans. In charge of the Prince's tour was Admiral Evans—"Fighting Bob", you know, of the old *Iowa*. One evening, as the party's special train drew near the state of Kentucky, Admiral Evans received a telegram from the citizens of Bowling Green, requesting that the train stop for a moment the next day in order that the city might have the honor of presenting His Highness with a token of esteem. So Evans approached the Prince on the subject.

"If your mission is to be a success, Your Highness, you must surely stop at Bowling Green. These are a very wild and interesting people. With wars and feuds, scarce a man reaches maturity unscarred. You will look about and see this man with but one eye, and that man with his ear chewed off by bullets, and another man with but one arm and one leg. And this country is noted for its beautiful women, its splendid horses, and its magnificent liquor; their's will surely be a handsome token. Oh, by all means, stop at Bowling Green."

So the Prince decided to stop at Bowling Green. And about noon of the next day he stepped out on the rear platform to receive the citizens and their token of esteem. Three men, each bearing a large jug, stepped forward. And sure enough, the first man had but one eye, and the ears of the second had been literally chewed off by bullets, and the third had but one arm and one leg.

Well, Prince Henry received the three jugs with a very flowery address of thanks and the train pulled out amidst cheers and the rattle of squirrel guns.

The Prince had spent two weeks in the country now and was pretty well acquainted with American drinks, but the three jugs had him stumped.

"Admiral, now, how do you drink this?"

"Why," answered Evans jocularly, "you take a large tall glass and you fill it one-third full from the first jug, and the second third from the second jug, and finish it off from the third jug. It makes quite a drink, Your Highness."

So glasses were brought and the Prince directed their fillings by his valet. First went in three broad fingers of brave old Kentucky bourbon, and on top of that went three stout fingers of ripe race rye, and to finish off that Herculean cocktail went three thick fingers of man-killing mountaineers' applejack. Clink, clink, went the spoon and the glasses were passed. "Skoal," or "Der Tag," or words to that effect, cried Prince Henry and took a mighty quaff of that mighty drink. You've got to give the German credit for being a real man when it came to hard liquor; half of that huge glass he killed before he brought it down from his lips. But when he did there was a look in his eye which was quite as hot as his throat must have been, which certainly was something more than tepid.

"And what," said Prince Henry of Prussia, "Just *what* do you call that drink?"

"That . . . . ," Evans paused, "why—a that—why that's what we call a *Torchlight Procession!*"

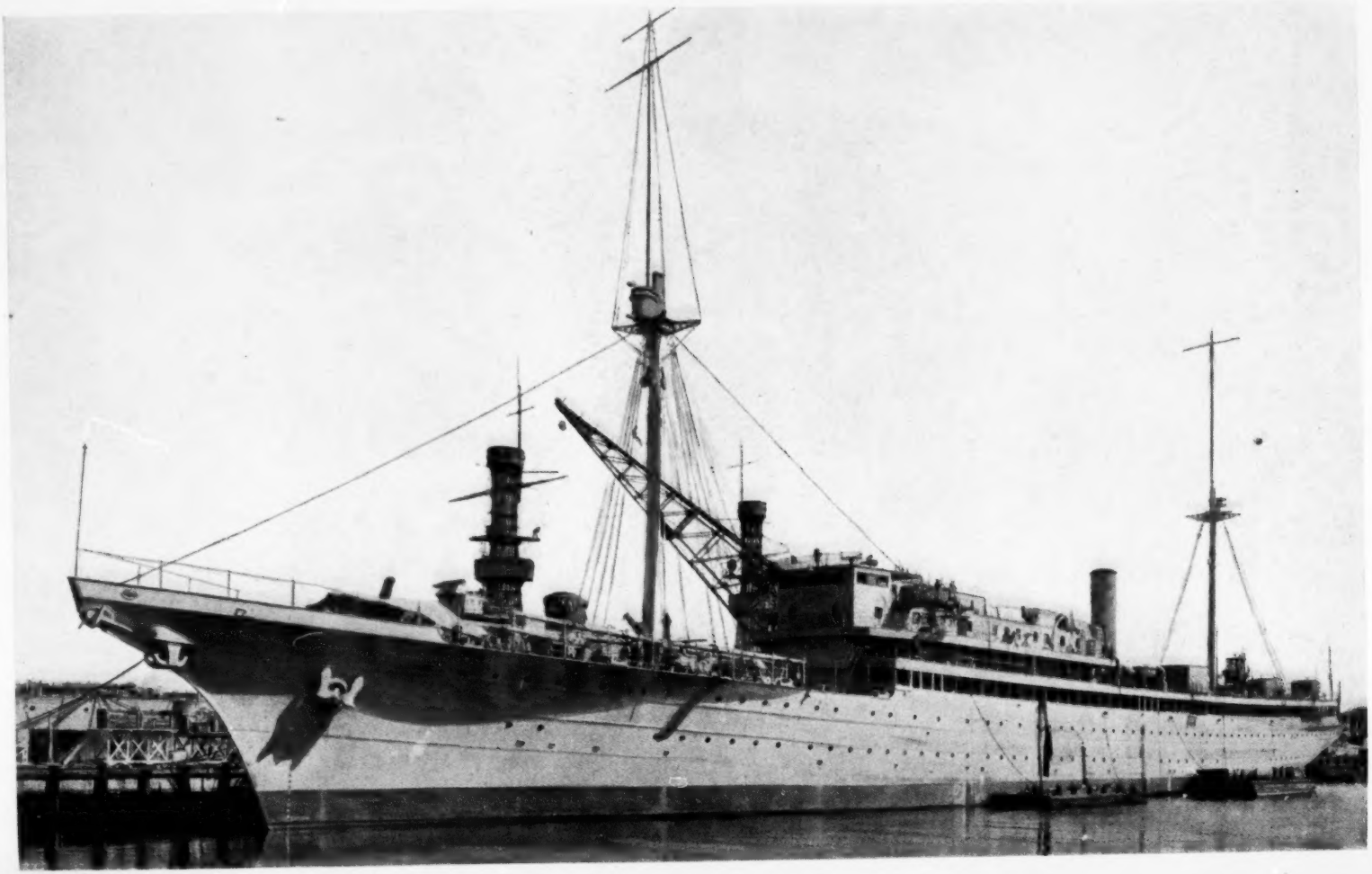
***Rear Admiral Robley Dunglison Evans, U. S. N.***

(See page 2197, November, 1926, PROCEEDINGS)

JOHN H. LLOYD.—I have read with a great deal of interest in the current issue of the PROCEEDINGS, the "Appreciation" on the life and doings of Rear Admiral R. D. Evans. Many of the doings of "Fighting Bob" that are part of our glorious old naval traditions, were not mentioned. One of the many reasons why "Jimpsey" was so admired by the British was due to the manner in which he handled the old *Saratoga* in a heavy sea, and a strong wind conning his old ship into her anchorage in the harbor of Portsmouth; the assembled British channel fleet that had gone in to anchor at that port was a witness to his fine feat of seamanship in bringing in his ship under canvas.

I was a member of that crew, and I was also a member of the crew of the *Yorktown*, when commanded by that fine type of our old sea warriors, many incidents could be related of his doings, his works, his interest in the old flat-foot on that tin pot of a gunboat.

Some time ago I was requested to write a summary of the cruise of the old *Trenton*, her last cruise which ended on the coral reefs of Apia harbor. In so doing I made many references to these old sea dogs, these old wooden walls that have kept aloft those old traditions, and to "Fighting Bob." One that is amusing was when he was in command of the old *New York* at Keil, when he informed old Cassidy, the ship's armorer, that he must address Emperor Wilhelm as "Your Majesty" and not "Yes, Kaiser." Afterwards, old man Cassidy, the flat-foot, received an Emperor's salute from his ship the *New York*. He had been found drunk ashore on the Emperor's dock, and King Billy had Prince Henry see that old Cassidy was placed aboard his ship. Prince Henry carried out the Kaiser's command by taking Cassidy aboard in the Emperor's barge, with the Emperor's pennant flying in the bow.



U. S. S. "HOLLAND," SUBMARINE TENDER

# Professional Notes

3 November to 3 December

Compiled by

Lieutenant Commander W. G. Greenman, U. S. Navy

GENERAL ARRANGEMENT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U. S. S. "Holland," Submarine Tender

## UNITED STATES

### *Lessons Jutland Has for Us*

Chicago *Tribune*, 7 November.—An article by Hector Bywater in the *Atlantic Monthly* emphasizes an aspect of preparedness the civilian is likely to ignore. Most of us think of naval strength crudely in terms of number of ships, perhaps in number of battleships. Few of us are likely to consider the importance of cruisers and auxiliaries, although we shall be doing that as soon as the project for another conference on naval limitation comes again into serious discussion. But when we have got as far as visualizing the Navy as it were, externally, as composed of battleships, cruisers of different types, desroyers, submarines, airplane carriers, gunboats, colliers, and repair ships, we are only dealing with the surface of naval strength.

Read Mr. Bywater's discussion of the battle of Jutland and you will realize that it is not so simple as all that, even considered as material and waiving such large questions as naval policy, strategy, tactics, morale, etc. There are ships and ships. The battle of Jutland revealed among other things serious defects in the construction of some of the British ships. Mr. Bywater says the German subsurface protection was much better than the British. "It was the British custom to design ships with an eye to existing dock accomodation. New ships were built to fit old docks, in consequence of which their dimensions, and particularly their breadth, had to be circumscribed, so that less room was available for protective devices below the water line." But the Germans gave their ships the measurements required for safety and efficiency, and built new docks, if necessary, to accommodate them. Mr. Bywater asserts that Admiral Jellicoe's movements at Jutland undoubtedly were influenced by his fear that his own ships were more vulnerable to torpedo attack than the German. As it happened gun fire was the important destructive agency at Jutland, but the fear referred to must have had an unfortunate influence upon the British tactics and in the next war a superiority of defensive construction against submarine attack may be more important than in 1916.

But another phase of construction which had more dramatic results was the placing of the magazines or means of protection of the ammunition supplies. Four of the great British ships blew up suddenly before their waterline was pierced. At least three German ships were hit in the same way but did not explode. The Germans, it seems, had experimented in protection against this danger and devised a method of avoiding it which was evidently reliable under conditions of battle.

Mr. Bywater says also that the German gunnery was better than the British and that the German shells showed higher penetration and disruptive power. We cite these points only to emphasize the fact that preparedness involves a constant industry and inventive enterprise in the perfection of the instruments of war. We might have a paper equality of ships but when the test came there might be a tragic revelation of inferiority in fact. Ship construction, munition quality, fire control instruments, devices for perfection of range and for locating the enemy above and below the water, protection within and without—in short, innumerable details of efficiency enter into the problem of preparedness. We cannot afford to assume that because we are an inventive and progressive people our naval and military preparedness will be up to our reputation. We sat on the rim of the European cataclysm for three years, yet when we went in we had no cannon, machine guns or automatic rifles up to the standard of our allies. We had to reconstruct even our infantry formation and to learn artillery technique from the French. We spent an enormous sum on airplane manufacture and got none over in time to fight. In short, we were not only unprepared for modern warfare in terms of quantity of men or ships, but also as to means and methods. Our ships showed no serious structural defects so far as the public knows, and acquitted themselves well so far as they were tested. But they were in no major action such as Coronel or Jutland.

Our point is that preparedness is not only a responsibility of congress. The professional soldier and sailor have their share. The general staffs of the Army and Navy, the War and Navy departments, must of course work within the financial limits of the provision made for them by congress and within the outlines of such policy as congress has adopted. But within these limits there is a tremendous responsibility for constant study, for alert observation,

for initiative, inventiveness, perpetual self-criticism and attention to detail. Says Mr. Bywater: "The British Navy had the biggest ships and the heaviest guns, but its controllers appear to have lacked the infinite capacity for taking pains which was so marked a feature of the whole German organization." Says Admiral Cecil Lambert, who was a member of the admiralty at the time of Jutland: "The want of success at Jutland was due mainly to the fact that ship for ship, gun for gun, engine for engine, there was a higher standard of efficiency in the German fleet than any which the British could claim. The great asset on which the British admiral could rely was the incomparable personnel of his ships; otherwise it was indeed a melancholy experience to find at the outbreak of the war that all the public money which had been expended in parliament, on the assurance that they were getting the best that money and science could provide, had produced such meager results."

May we never make the same discovery. That will largely depend on the spirit of enterprise and progress in the services themselves. That spirit must be strong enough to resist discouragement and the greatest enemy of efficiency, routine.

### *Geneva Arms Parley Failure Should Stir U. S.*

[*By* Capt. Dudley W. Knox]

Baltimore *Sun*, 8 November, 1926.—The failure of the preliminary "disarmament" conference at Geneva to come to anything approaching unanimity seems to postpone indefinitely any effective advance in the reduction of armaments.

Military limitations is split on the rock of reserves. Naval limitation differences revolve about the so-called "global tonnage" proposal of the French; an expedient clearly aiming at wide latitude in the construction of submarines and other auxiliaries. Instead of a limitation on the total tonnage of each general class of ship, as was the plan at the Washington Conference, the French would merely limit the aggregate tonnage of an entire navy, without considering the various classes of ships.

#### Deadlock is Unfortunate

This impasse must be regarded as unfortunate not only from the viewpoint of disarmament but also on account of the anomalous naval position in which this country is left.

It will be recalled that the Washington agreements placed a limit only on capital ships and aircraft carriers, leaving unlimited all classes of so-called "auxiliaries," which comprise cruisers, mine-layers, destroyers, destroyer leaders, submarines, etc. At the time of these agreements we were relatively very powerful in capital ships and weak in auxiliaries, especially destroyer leaders and cruisers. In the "scrapping" program which followed we reduced our capital ship strength down to the prescribed 5-5-3 ratio without obtaining any corresponding recompense from the other nations in the way of a reduction of their strength in auxiliaries.

#### Build Auxiliary Ships

Since the Washington Conference other powers have gone forward vigorously with the building and projection of new auxiliary tonnage, especially cruisers, while we have felt it desirable to set a good example against renewed competition in armaments by refraining from any considerable new programs. Thus our relative weakness in this important form of naval power has grown steadily worse ever since the agreement of 1922.

In American naval circles there has been an earnest hope that this anomaly would be rectified at Geneva by agreements toward limiting auxiliary tonnage. Only in this way could the Washington naval treaty be made effective and building competition with all its evils be really stopped.

Since the failure at Geneva there seems to be no other way for us to balance our fleet and to approach a 5-5-3 ratio of total naval strength except by attempting to build up to the other principal naval powers.

#### Japan Building Cruisers

The present situation respecting cruisers, which are the most powerful and most important class of auxiliaries, will illustrate the general case. Of the modern type, carrying 8-inch guns, Japan has built two and is building six more. Great Britain is actually building eleven and has appropriated for three others. We are building two and have appropriations for three others.

So that, omitting paper programs of projected construction for which no money is allocated, we have the comparison, Great Britain 14, Japan 8, United States 5. If less powerful and more nearly obsolete ships were brought into the comparison it would be even more unfavorable to us. At this rate we will soon be outclassed.

### LACK DESTROYER LEADERS

It has become the fashion abroad to meet every American argument showing our relative weakness in auxiliary tonnage with a reminder of our great number of war-built destroyers and submarines. It is true that they have been a great asset. But our preponderance in destroyers has been largely nullified by our having no destroyer leaders whatever, and comparatively few small fast cruisers without which destroyer operations are badly handicapped.

With the passage of each year since the conference our destroyer power has grown relatively smaller, because other nations have been constantly replacing obsolete with new destroyers, while our construction has remained stagnant. After about twelve years a destroyer is supposed to be obsolete. Our newest destroyer is six years old, and the great bulk of them are seven or eight years old.

The case of our submarine situation is very similar. No longer can our destroyers and submarines compensate for a great and rapidly increasing deficiency of cruisers.

### CRUISER FOR GENERAL UTILITY

Next to the capital ship the cruiser is the strongest and most important naval type. It is a kind of "general utility" fighting ship, being of great use in nearly every kind of naval operation. It gains essential information to govern the movements of the whole fleet. It acts as a connecting link between the battleships on the one hand and the destroyers, submarines, mine-layers and air units on the other hand. And for all these latter types it is an essential support in fleet battle.

Especially for destroyer operations is the chaperonage of cruisers necessary. This was demonstrated very forcibly at the battle of Jutland, where every large destroyer attack failed or succeeded according to whether it was properly supported by cruisers.

This need of cruisers for destroyer support renders it indispensable that the former shall have very high speed, which in its turn forbids their carrying much heavy armor or other protection. These requirements result in a type of ship very much like an enlarged destroyer, the increase in size giving splendid seagoing qualities and making it possible to carry a heavy battery. This combination of high speed and great gun power permits the cruiser to run down and defeat weaker vessels and to avoid action with ships which are stronger.

### DEPLORE LACK OF HEAVY ARMOR

Some critics have deplored the poor armor protection of the new cruisers, notwithstanding their large size. Sir George Thurston, the eminent British authority, has answered this well by saying:

"Protection could under no conceivable conditions render the vessel safe under the artillery attack of a battleship or similar cruiser, or, for that matter, even from the guns of a destroyer if by chance the vessels met unexpectedly within short range. Therefore, protection is the feature which one can best afford to neglect in the design. Speed coupled with heavy armament being all essential, the vessel should have the maximum speed compatible with a reasonable number of the largest caliber of guns, even if the protection of the vessel and guns is reduced to a minimum."

Since the Washington Conference limited the size of the cruisers to 10,000 tons and their largest gun to eight inches in caliber, practically all countries have laid down vessels incorporating these maximum limits. Automatically smaller cruisers with smaller guns have become virtually obsolete. We should see to it that our new designs come up to the modern standard, and we should build enough cruisers to balance up our fleet at least until an effective limitation of naval armaments appears to be forthcoming.

NOTE—Under the United States in the Professional Notes of the November PROCEEDINGS an article was published from the September issue of the *Ship Builder* on the "Launching of the U. S. Airplane Carrier *Saratoga*." The Editor wishes to state that this article is a brief of a paper by Mr. E. H. Rigg read before the Society of Naval Architects and Marine Engineers in New York City in November, 1925.

## GREAT BRITAIN

### *The Limitation of Navies*

*The Engineer,* 19 November.—In the absence of news to the contrary it is to be feared that the labors of the preparatory commission on disarmament, which met at Geneva last May and has since held numerous sittings, have not yet led to positive results. Had it been otherwise the fact would certainly have been broadcast as a matter of international importance. From the somewhat meager reports of the proceedings which have come to hand, it is evident that fundamental differences of opinion exist among the various powers on the subject of armament limitation. The attempt to discover a formula for the reciprocal reduction of armies and air forces appears to have failed completely, hedged about as this question is with thorny political issues which have hitherto baffled every resource of statesmanship. Nor does any greater measure of success seem to have attended the effort to devise ratios of strength in those elements of naval power which lie outside the scope of the Washington Treaty. France, for example, is unwilling to draw any distinction between her land and sea forces, holding them to be one and indivisible from the point of view of national defense. Italy and other continental states have adopted a similar attitude. America, on the other hand, virtually disclaims interest in the problem of land armaments, and, according to her delegates at Geneva, is only concerned to bring about a further reduction in naval strength. Great Britain and Japan are in sympathy with the American view, even if their respective geographical situations do not permit them to be quite so indifferent to questions of land power. But, since battleship fleets are already subject to restriction, the chief incentive to naval rivalry has disappeared, and we must confess our inability to comprehend American anxiety on this score. There appears to be an impression in the United States, carefully fostered by the service interests of that country, that the Washington Treaty has done little or nothing to check competitive building abroad, and that in consequence, the American Navy is falling below the standard of power prescribed by the treaty. A very active propaganda, not wholly free from a suspicion of official encouragement, is being conducted on these lines, the purpose being to induce Congress to make larger appropriations for new construction. No objection could be taken to this movement were it not for the tendency to misrepresent Great Britain as the protagonist in the new "naval race." It may therefore be opportune to review the facts.

A study of current programs at home and abroad fails to reveal any signs of what could fairly be termed a naval competition. Since the year 1921 only two capital ships have been laid down anywhere in the world, and the idea that energy formerly spent on such vessels is now devoted to the production of other types of fighting craft is not borne out by statistics. British shipbuilding operations since the war have been on a decidedly modest scale. In spite of our dependence on the integrity of the sea routes and the pronounced shortage of cruisers for commerce protection, six years elapsed before we began to build vessels of this class, the first batch of five being laid down towards the end of 1924. In the meantime, however, the construction of more than thirty cruising ships for foreign navies had been begun. From the Washington Conference to the present date—that is, a period of five years—we have laid down twelve cruisers, two destroyers, and four submarines. If that is "setting the pace" in naval construction, words have lost their meaning. It is true that parliament last year adopted a program for the systematic replacement of obsolete cruisers and other light craft during the ensuing five years. This program, however, is liable to be modified in the event of a change of administration, and in any case the aggregate of tonnage which it represents is considerably less than the total provided under the post-war building schemes of the United States, France, or Japan. So far from having led the way in naval construction during the post-war era, we have lagged behind, and the amount of leeway to be made up, if we wish to preserve a measure of sea power at all proportionate to our needs, is very great. It would, no doubt, have been better for all concerned had the Washington Conference imposed a check on the multiplication of cruisers and submarines, as well as on heavier ships. That it failed to so do was emphatically not the fault of Great Britain. Had our proposal for the abolition of submarines been sup-

ported by the United States, it is scarcely to be doubted that the attempt to eliminate these craft would have succeeded, in which case the way would have been left clear for an all-round limitation of combatant shipping. But no such support was forthcoming. The United States joined with France in conferring a formal benediction on the submarine, thus rendering impracticable the restriction of the light surface craft which are its natural enemies. Recrimination is futile, as President Coolidge has just reminded the world, but in view of the persistence with which American publicists saddle this country with responsibility for a naval competition which they alone are able to discern, it is pertinent to recall the antecedent conditions from which the present situation has developed. So far as we are able to ascertain, the American naval authorities are disturbed by the growth of foreign cruising fleets, and are anxious to arrest it by a new treaty of limitation. But this, as we have seen, is impossible so long as submarines continue to form an integral component of the naval organism. The destroyer is needed primarily to combat the submarine, and the cruiser must be there to afford protection to the destroyer engaged in anti-submarine operations. The United States, virtually self-supporting in the matter of food supplies and other essential commodities, and separated from potential enemies by the width of oceans, are less in need of naval power than Great Britain. That is a self-evident fact, which no amount of propaganda can alter or obscure. Nevertheless, if the United States desire to expand their navy, and even to bring it up to the Washington Treaty standard in every class of tonnage, nobody in this country is likely to raise the slightest objection. It seems unreasonable, however, to expect, us to reduce our fleet to a level inconsistent with our minimum needs merely in order that the United States may be spared the expense of building new ships. The truth is that Great Britain has already made very serious sacrifices in the cause of disarmament. For several years after the war we voluntarily observed a "naval holiday" while other powers, including the United States, were turning out new ships in large numbers. When the pace became too hot and the Washington Conference was convoked, we accepted without demur an American proposal that deprived us of our traditional supremacy at sea, and left us with a battle fleet absurdly small in proportion to our naval commitments. Nor was that all. The building of warships had been for many years one of our great national industries. This industry was practically ruined by the Limitation Treaty, and the loss which the country has sustained thereby is incalculable. Yet in spite of its serious drawbacks, both from the naval and economic points of view, we have loyally adhered to the treaty in letter and in spirit, accepting it with better grace than certain other countries to whom it is far more advantageous.

Whether any further restriction of naval armaments can be brought about depends, in the first instance, on the international attitude towards the submarine. At present this weapon is being actively developed abroad, and we notice that the United States, France, and Japan are all constructing boats that surpass the British *X-1*, which has hitherto held the record for tonnage. More than seventy submarines are already under construction or projected for the foreign governments which are associated with us in the Washington Treaty, and new programs are in view. While this state of affairs continues, we cannot see any prospect of a reduction in the cruiser and destroyer establishments which jointly constitute the main defense against submarine aggression. At the same time, however, the sum total of naval shipbuilding now in hand is small compared with the average volume in any year prior to the treaty, the rate of construction is very much slower, and there is no definite symptom of a competitive spirit in any quarter. Naval disarmament, in the literal sense, remains a vision which can hardly be realized till the Millennium; but a survey of the world's navies today shows that naval limitation is an accomplished fact. The discussions at Geneva will serve a useful purpose if they focus attention on the main obstacle to further progress in this direction, which we hold to be the continued existence of the submarine.

### *Singapore Dock Yard Contract Let*

*Christian Science Monitor*, 17 November.—The announcement that the contract has been let for a £1,200,000 floating dock at Singapore is held to indicate that the Imperial Conference has reached an agree-

ment on the question of financing the construction of a huge new naval dockyard in the Far East, the building of which has long been a bone of contention among political parties here.

The construction was first proposed in 1923 by the Conservative Government. The Labor Government dropped it the following year, but nine months later, when the Conservatives came into power again, the scheme was revived, though the resumption of work was delayed for financial reasons—Australia, which had promised a large grant, having diverted the money to the construction of new cruisers, when the Labor Government first announced its intention of not proceeding with the work. The total cost at the lowest estimate will be £12,500,000 and the Baldwin Government was unwilling to put such a large sum on the overburdened shoulders of the British taxpayer.

### Australia, New Zealand and India Refuse Contributions

New York *Times*, 3 December.—Definite intimation from Australia, New Zealand and India—the three British dominions most interested from the point of view of their security—that they could not contribute toward the cost of the Singapore Naval Base, although they recognized its necessity, is one of the features of the report of the Imperial Conference on Imperial Defense, issued today. As regards naval defense, it was evident from the statements of the different Prime Ministers that, while Australia is maintaining a small but efficient fleet and New Zealand will continue to keep up her own division of the British Navy, little or nothing could be expected from the other dominions. They all, however, are doing a good deal for the development of military and civil aviation.

Premier Stanley Baldwin said in his opening speech before the committee that the British Government, after full consideration, had decided that the Singapore base must be proceeded with, since it was essential that the fleet should have full freedom of movement throughout the empire. It was only part of the full Admiralty program, but, even so, the cost would be very heavy and the contributions of £2,000,000 from the Malay States and £250,000 from Hongkong were highly welcome. Mr. Baldwin expressed the hope that those dominions which would benefit would also contribute. As regards Great Britain's defense from air attack there was, he said, less anxiety than in 1923. Research committees were at work and insurance schemes had been carried out.

Premier Bruce of Australia emphasized the primary obligation of each dominion to provide its own defense. There had been spent last year throughout the empire for defense, he said, 52 shillings per head by Great Britain, 27 by Australia, 13 by New Zealand, 6 by Canada, and 2 shillings sixpence by South Africa. He suggested that the equality status brought with it defense obligations that were not being met at the present by the parties affected.

Mr. Havenga, Minister of Finance of South Africa, said that the extent of his country's participation in war would depend upon the extent of her interest at the time, but that, subject to this understanding, it was the government's policy to keep her military organization in harmony with that of Great Britain.

### A Japanese Viewpoint

Japanese *Advertiser*, 2 November.—It is perhaps not to be wondered at that the British Imperial Conference is being closely followed in Japan. An explanation of the phenomenon is that the nation, still bound in sentiment to its co-belligerent in the World War, observes with more than passing interest the happenings that may or may not affect the solidarity of the British Empire. It is admitted that the Anglo-Japanese alliance was replaced—whether willingly or unwillingly by the High Contracting Parties—by the so-called Quadruple Treaty as regards the Pacific, but it has nevertheless left behind it a memory which any nation should be proud of. So that, albeit the times have changed and no one today will believe in a revival of the discarded policy, there can be little doubt as to its aftermath being an asset in the relations of the two Empires.

Besides this sentiment of friendship for Great Britain, Japan's enlarged interest in the world affairs offers a clue to the interpretation of the phenomenon in question. The interpretation is certainly a plausible one and has a series of events to support it. Briefly stated, the fact also is attributed to a change of circumstances—a circumstance

which was scarcely realized even by the Japanese themselves a decade or so ago. In consequence one may take it for granted that the various international conferences of recent years contrived to alter their point of view internationally; but their vista has thus come to be extended beyond the limits of the Far East. As a matter of fact, no political or economic occurrence in Occidental countries is now too remote to claim their attention. In another word, they are convinced more than ever of the unity of the world, the multiplicity of its existing barriers and prejudice notwithstanding.

To these explanations we may add yet a third, which may be stated at once as a Japanese reaction to the Singapore naval scheme. Despite the silence of Japan's officialdom and British disclaimers that they have no ulterior motive in the matter, the truth is that Japan has been looking askance at the strange gesture of her erstwhile ally. Such a pass was foreseen by Viscount Grey of Fallodon when he opposed the scheme at its inception, and Japanese newspapers were then, as now, outspoken in their efforts to prove that the proposed undertaking was impolitic at best. They seem to think that a naval base at Singapore savors more of an offensive than a defensive project and is, in the last analysis, directed against Japan. Arguments, or professions to the contrary, in their view, are nothing more than subterfuge.

Apparently, this apprehension of the vernacular press is shared by the reading public in general. This is the main reason underlying the Japanese attitude towards the Imperial Conference. Hence the vigilance over what may be said or transacted in London. On the other hand, the Commonwealth of Australia, with its admittedly vast interests in the Pacific, is naturally most concerned with the outcome; no stopgap concession will satisfy it. But the antipodean statesmen have on this subject the sympathetic ear of Conservative England. At any rate, the Australian case appears to have been well received, and Mr. Garvin is quoted as having remarked that the Far East presents real contingencies of wide danger; therefore the issue on Singapore is no longer debatable.

The editor of *The Observer* did not in all probability intend to convey the idea that the present situation in this quarter of the world augurs ill for the British Empire. To say the least, it is bad enough; let every one acknowledge this. And yet, what about Europe? Will the "Locarno spirit" transform it in any degree, or reduce the burdens of the British or French tax payers? True, the conditions prevailing in China are well-nigh intolerable. But they may improve; they cannot be worse. Thanks, moreover, to the powers' concert on the policy of non-intervention in the country, a potential source of international rivalry has been eliminated. The cry of unfair competition in the Chinese market, which provoked considerable but mostly misdirected comment in America and England, subsided. What is more, the singular deduction from Japan's naval program that she must have some aggressive design in store is wrong and misleading. She is no solitary example for that matter.

None the less, the perennial fear that Japan is going to encroach on others' rights seems doggedly to persist. It may be submitted that this preconception is in a very large measure responsible for the uneasiness felt abroad. As a case in point, we may turn to the over-worked theory that sooner or later Japan, because of her surplus population, will forcibly challenge the doctrine of "White Australia." Such an assumption at once denies her that wisdom and prevision with which she has been credited and discloses, as an old Japanese proverb has it, the mentality of a rich shop-keeper who takes every passer-by for a thief! The same may be said of American or Canadian scaremongers. Even so, he or she may rest assured that no unwelcome immigrant from Japan will invade his or her habitation. Why, then, all these wild speculations?

In sum, Great Britain and the dominions are perfectly free to decide on the course of action they are to pursue. That is to say, they may safeguard their home and overseas interests in the manner that pleases them. In the particular instance the naval agreement of Washington excludes Singapore from the scope of its application. The conclusion is that, apart from the possible consideration of international comity—which is quite a distinct question—nothing prevents the fortification of that place; it may indeed be a precaution well taken. Withal, it has given occasion for too much and altogether unnecessary searching of heart on both

sides. That has to be stopped. It is mutual confidence more than anything else that is needed in this distracted planet of ours. And without such confidence, man will be accursed as ever for his damnable use of the steel and fire. *Crede quod habes, et habes.*

### *A Naval Career*

*Army and Navy Air Force Gazette,* 20 November.—Once again, as the period for the half-yearly naval promotions approaches, there is discussion upon the merits and disadvantages of a naval career. Since the midsummer promotions the zones of selection for both captain and commander have been widened, increasing the number of eligible commanders from about 128 to 192, and of eligible lieutenant commanders from about 388 to 447. Nothing has been heard of any addition to the numbers of vacancies, which have for some time past been ten for captain's rank and twenty for that of commander. But even with a slight addition, the percentage of those who overcome this difficult hurdle in the race is extremely small. For the great bulk retirement at or before the age of forty-five is the rule. Rear Admiral A. P. Davidson, in a *Times* letter which, like others by this officer, is much to the point, notes the influence this fact must have upon the inducements to enter. Those parents who look to "continuity" and "safety first" will not, as he says, plump for a naval career for their sons. Despite all handicaps, the majority of veterans, he affirms, will say about the choice of a naval career that "It is the finest profession in the world." But to get the navy popularized, and to get the pick of prospective candidates, the problem of the early retirement of a large percentage of lieutenant commanders must be tackled.

This is no doubt one of the problems which are being considered by the Chelmsford Committee which is now enquiring into "the policy to be pursued in future as to the list of executive officers of the Royal Navy." It is unlikely that the report of this body will be published, any more than those of the Hoskins Committee in 1894 and the Goschen Committee in 1902. But if the reported intention to lower the retiring age limits is at all correct, it will accentuate rather than relieve the problem of the early sacrifice of so many officers of distinction and promise. It may be very desirable, from the standpoint of producing young flag officers, to begin the winnowing process earlier, but the effect upon the officers who have to be retrenched, upon the navy in general, and upon prospective parents of cadets, must not be lost sight of. One way in which the difficulty of early retirement might be eased is suggested by Commander Denny, of the Navy League, for business firms to offer employment to those who are "axed." No doubt much could be done in this way. But in the main the problem has always been with us, and probably always will be. It is to be found in most navies, although not perhaps to the same extent as in our own. Just now, after a great war, it is acute, but the very fact that the lists are being cleared now will facilitate the progress of boys who are about to enter, who will also benefit by the increased opportunities for specialization in the air and other branches.

### *Duration of Warship Commands*

*Naval and Military Record,* 27 October.—There has been some criticism of late regarding the inequality which is being observed in the duration of warship commands. In some cases captains are being relieved much before the prescribed period. It is very rare indeed for a commanding officer to remain on appreciably over his time, and extensions, by no means uncommon in bygone days, are now virtually unknown in ship commands. The Admiralty admits that the rules are nowadays being rather more honored in the breach than the observance, but explain that the great aim is to give rotation of employment to as large a number of officers as possible. This is all very well as a principle, but there are other not unimportant factors to be weighed against it. In the first place, it gives rise to a feeling of instability which is undesirable. In the next place, frequent changes of command have a dislocating effect upon the life of the ship. What may have been one captain's meat may prove the next captain's poison. Relatively speaking, the half-pay captains' list is not larger than it was in bygone days, and why it should be more desirable to ensure a quicker rotation of employment now than it was considered to be in the past is not altogether clear.

The reduction of ship commands on home service to one year was generally regarded

in the service as a mistake. It is too short a time for an officer to get the best out of a vessel and her complement, for the simple reason that, however zealous he may be in the interests of the service, the knowledge that he will be due to go just as he begins to get things shipshape according to his idea of efficiency is bound to stultify interest. On foreign service the three years' rule is still supposed to apply, but in point of fact it very seldom does. Very long commissions, especially on remote stations, are undoubtedly bad. We have before suggested that no hard and fast rule should be laid down for all foreign service, but that the length of commissions should be graded with reference to the character of each individual station. Men in routine training will go on improving up to a point, but when that point is reached they become jaded; sick of the ship and sick of one another, and then it is high time to give them a change.

## FRANCE

### *New Naval Policy*

*Rivista General de Marina,* October, 1926.—[Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy.] In conformity with the economic policy of the present government, the French Admiralty has decided to make all possible reductions that are compatible with the efficiency of the navy. As a first measure, and imitating the example of England, though not with the rigidity with which said notion proceeds, all such units as are antiquated will continue to be discarded. In the French Navy there are few light units of the fighting power of the English destroyers, type R, that are now being retired from active service. On the other hand, there are maintained on the list of war ships armored cruisers of 12,000 and 14,000 tons, contemporaries of the English series of the *Cressy* and *Drake,* which are about twenty-two or twenty-five years old, and the most modern French war ship, the *Lorraine* type is approximately of the same period as the oldest war ship in the English fleet, the *Iron Duke* type. Recently the order had been issued to overhaul the old armored cruiser *Jules Ferry* of 1903; but it appears that the order has been withdrawn. This does not prevent the existence of diversity of opinion as to the value of cruisers of that type and of the *Edgar Quinet* type, which carry cannon 7.5 and 6.5 inches. There are partisans for their modernization, who consider them much superior to the *Washington* type of 10,000 tons practically without protection.

If the French Navy is far from occupying today the place she sought to occupy in surface ships by reason of tradition and colonial interests, the French Navy has a very efficient submarine fleet. And if is true that the English and American fleets are more numerous, which is not without importance in war time, it is also evident that, so far as concerns quality, careful construction, security and perfect harmonizing in conformity with most modern requirements, France maintains herself at the head. The experience of the last war showed her specialists the two classes of value, somewhat contradictory, existing with regard to submarines: for instance the value on paper, such as represented in the navy year books, and the fighting value, which depends on the robustness and security in all its details and the facility in handling. As a result of experience, the true French technical men pay no attention to the first of these values. French pre-war submersibles were "the first in the world" in speed and military utilization of displacement. On the contrary her post-war submarines are modest on paper. Their maximum speed on surface is 14 to 16 miles, and there is no desire to improve in that respect. Simplicity and security in handling as well, as in the handling of its armament, joined to a high degree of sea worthiness and a long radius of action are exclusively the qualities required. Nothing has been left undone in the effort to attain that end; everything has been subjected to study; laboratory experiments and trials at sea decided every detail of the plan. Facts have demonstrated the most complete success, and France disposes today of a submarine fleet the efficiency of which France was far from possessing in 1914, particularly so far as action at long distances on the oceans is concerned.

### *Naval Notes*

*Naval and Military Records,* November.

#### BUDGET

The 1927 naval budget amounted originally to 1,915,000,000 francs. The suppression of the Rochefort port militarie reduced

it by 6,600,000 francs, and finally, the financial committee of the Chamber curtailed it by 104,000,000 francs, bringing it down to 1,805,000,000 francs—a huge expenditure in appearance, but representing only 300,000,000 francs in pre-war value, thus not quite half the French naval credits for 1913. This modest outlay for sea power contrasts with the enormous naval expenditure of un-imperialistic America and with the efforts of all-conquering Mussolinian Italy. It is a sign of the times that the navy and army credits are the only ones to have been reduced in the French 1927 budget. More and more "France is declaring peace to the world," as was stated by that genial and exceedingly clever politician, ex-Premier Herriot, who just now, as Minister of Public Instruction, is asking for more money with a view to having peace taught in French schools.

The 1926 budget amounted to 1,523,000,000 francs. The increase of 192,000,000 francs goes entirely to new construction, comprising the last credits for the thirty-four units of the 1922 program (three cruisers of 8,000 tons, six 2,400-ton destroyers, twelve 1,460-ton *torpilleurs d'escadre,* six 1,140-ton submarines, six 600-ton submarines, and the seaplane carrier *Béarn,* of 25,000 tons, all of which are to be commissioned in 1927), for the completion of the nine submarines of the 1923 program and of the ten units of the 1924 program, and for pressing forward the construction of the twenty-one units of the 1925 program. Moreover, seventeen new units belonging to the 1926 program are to be laid down, viz., a 10,000-ton cruiser, three destroyers of 2,700 tons, four torpedo-boats of 1,500 tons, and thirteen submarines. Altogether naval credits will be divided between eighty-four new war ships, mostly of small *pousiére navale* size, going from 600 to 10,000 tons. All the same, it speaks of systematic renovation and of homogeneous and efficient designing. The combined efforts of Italy and Spain, that besides possess strategic positions of vantage in the Mediterranean, will, nevertheless, prevent France gaining the ground that had been expected.

For so many new ships increased personnel is necessary. To that end two cruisers, nine destroyers, and four submarines have been condemned in 1926, and further discarding will include in 1927 a cruiser, two destroyers, and three submarines, besides several gunboats. It is reckoned that 4,000 additional *matelots* will be needed in 1927. The naval personnel will exceed 55,000. Credits for crews are increased by 50,000,000 francs; officers are to be better paid, and the general comfort on board to be improved.

No battleship construction is being thought of. The 17,000-ton armored "destroyers of cruisers" that would have given France an exclusive advantage for a few years to come have been given up, for the present, as being too costly and imperialistic-like. Washington-standard cruisers of 10,000 tons will continue to be built, although, in the opinion of many admirals, they are expensive make-believes, possessing in a superlative sense those defects, especially extreme vulnerability, which Lord Charles Beresford so bitterly stigmatized in the British *Glorious, Courageous,* and *Furious.* The existing 24,000-ton *cuirassés, Bretagne* and *Paris* types, are being modernized at great expense. The 13.4 and 12-inch guns have gained in range and accuracy; their motive power has been improved on economical lines, and their defense against shells, bombs, and submarine explosions has been the object of painstaking attention—though not on a scale quite so wide as that applied to the reconstruction of British capital ships.

Coast defense will absorb twenty-two million francs. Ports militaire, Toulon especially are being screened by super-cannon and anti-aërial batteries on up-to-date lines. Franch ballistic science is ever making headway. Protection against aërial bombardment is being attended to on both passive and active lines.

Naval aviation—of late sadly neglected—will entail an expenditure of 112 million francs, against ninety-one in 1926, for hangars and new flying machines, the life of which is estimated at two years in commission. New aërial bases are to be created. Bizerta, strategically the most important, is to be strengthened. The French naval aviation program, inferior to that of Italy, is only to be completed in 1938.

Fuel is to cost 133 million francs, of which ninety-two million is for oil. No less than 215,000 tons of heavy mazout oil are to be bought, 171,000 of which are for fleet consumption during the year and 44,000

for fleet reservoirs. An outlay of twenty-seven million francs is earmarked for the erection at further reservoirs in ports militaires, as well as at Bizerta, Casablanca, and Dakar. The French fleet means to have freedom of movement in North Africa.

### AVIATION

New and highly instructive details are available of the combined aërial cruise carried out a few weeks since in the Levant by three Golliath-Farman seaplanes of the Bizerta base. The distance covered was 3,400 miles, and the flying time fifty-seven hours. There were four officers and petty officers on board each machine. A very energetic and go-ahead officer, Lieutenant de Vaisseau Paris, was in charge of the *escadrille.* Malta, where Commander Crooke heartily welcomed the visitors, Argostoli, Phalera, La Sude, Beyrouth, Makrie Phalère Argostoli, Malta, and Bizerta were on the route followed. The object was commercial and diplomatic, as well as military. The instructions were group flying, but each machine was to pursue the journey at all costs if the others dropped behind. All three accomplished the voyage successfully, despite a tempest encountered in the Gulf of Patras, a 35-mile wind, and heavy seas on which they tossed at anchor without accident for a full night. Similar experience was gone through happily off Candia, waves attaining twenty-four feet. Tanks and stores were replenished at prearranged places by the gunboats *Calais* and *Bethune.* Wireless telegraphic communications were maintained all through the voyage within a 300-mile range. The Goliaths that have to their credit this performance are ordinary bombardment machines that flew from Paris to St. Raphael-Toulon, were there fitted with floats, and, without further ado, started on their promising seaplane career under trained naval crews. The sea and airworthiness of these heavy bombers and their perfect reliability open new and far-reaching possibilities of a strategic order, somewhat revoltionizing the naval game.

Despite the ingenuity of French designers and the dash of officers *de vaisseau* who have specialized in flying, Gallic naval aviation is sadly lagging behind. Stability and competence are wanting at the head, and the oft-discussed aërial program only exists on paper, with the result that important credits voted for naval aviation have been left unused and have been lost to the navy. Time and money are wasted in spasmodic efforts; sensational giant hydravions, regarding which much fuss has been made, are apt to be buried in oblivion, together with the instructive data gained in their trials. Giant machines represent many eggs in one basket; their commissioning is costly and risks are involved, with the consequence that few pilots are trained in handling them. Genius and pluck are never wanting in la belle France, but are of little avail without will and continuity of views and efforts in the direction.

The silent, irresistible headway made by German and even by Italian aviation form a marked and, to a certain extent, disquieting contrast. France is seen to lose ground in a field where she did pioneer work and had, apparently, the best assets on her side. The American Navy is a long way ahead. U.S. cruisers have seaplanes that put them to sea and air daily as a matter of course, as the *Memphis* did in St. Nazaire. Last week in Cherbourg Harbor a seaplane-launching catapult was tried for the first time, a few days ago, at Brest in the cruiser *Duguay-Trouin.* This experiment, thought to be dangerous and for which Captain Dumont, of the cruiser, and Lieutenant Demougeot had volunteered, was completely successful. The catapult, made at St. Nazaire, after many experiments, is more powerful than the American type and can launch heavier machines. The 25,000-ton seaplane-carrier *Béarn,* under Captain de Laborde, is slowly preparing for her trials. A 23-knot speed is looked for, which is inferior to that of most English, American, and Japanese carriers. The Mediterranean is now being crossed weekly by French aviators—proof of activity that means much for the eventual defense of the French North African Empire. Captain Burri has just made the Algiers-Marseilles voyage in little over five hours (440 miles) in a hydravon *Metéose.* When the distance France-Bizerta can be bridged in a few hours, it is obvious there is strategically a *fait nouveau* in the Mediterranean, namely the predominance of the air factor.

### NAVAL SUPERIORITY

Italian naval critics are fond of claiming naval superiority over France. The supe-

rior speed of Italian dreadnoughts, the greater number of their light-cruisers and modern destroyers were the arguments put forward. The situation, however, has changed much to the advantage of France. The three 8,000-ton and 34-knot *Duguay Trouins,* together with the three *Tigres* and six *Simouns,* of 2,400 and 1,500 tons and 34 to 37 knots, which Admiral Violette is shortly to receive, will give him a crushing superiority over Italian light-crusiers and flotillas. Speed and caliber will be on the French side, the three *Bretagnes,* improved copies of the British *Orions,* mounting 13.4-inch guns, whereas Italian ships carry nothing above the 12-inch type. As to the strategic advantages Italy derives from Sardinia and Sicily, they are counterbalanced by Corsica, that may be made to cut vital lines of communication, by sea and by land, of the peninsula.

*Revista General de Marine,* October, 1926.—[Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy.] —The yards of Brest have been awarded the contract for the construction of two new submarines included in the naval program of the current year. They will be of the type of the *Requin,* improved and somewhat larger. The *Requin* was tested on the long trip to Dakar, so was the *Marsouin,* which has just completed a brilliant trip through the Baltic demonstrating the value of her class. The construction of the two new submarines will have to begin on the first of June next at the latest. They are to have their trials before November, 1929.

## JAPAN

### *Japanese Merchant Marine*

Japan *Advertiser,* 13 October.—There are three routes from Japan to the Atlantic coasts. One is the European route through the Indian Ocean and the Mediterranean; the second is the North American line, and the third is the Trans-Siberian Railway. The line connecting Kobe and Marseilles is transversed in forty days by the British P. and O. liners and by the French M. M. Steamers, but the Nippon Yusen Kaisha steamers cover this distance in forty-two days. The American Dollar line steamers cross the Pacific to Yokohama from San Francisco in sixteen days, while the Nippon Yusen steamers cover the same distance in seventeen days. The Dollar lines finish the course between Yokohama and Seattle in eleven days, but it takes sixteen days for the Nippon Yusen Kaisha ships. The Canadian Pacific Steamship Company's liners cross the Pacific from Yokohama to Vancouver in ten days, while the Osaka Shosen Kaisha steamers reach there after two weeks' voyage.

The speed of our ships is very slow, as indicated by the above statement.

The Nippon Yusen Kaisha is now building steamers of fair speed, but they are all to be used for the service to San Francisco only. Japan as a maritime nation will drop behind others and her shipping business will be overpowered.

The passenger service of the Trans-Siberian Railway connecting Vladivostok and Paris having improved remarkably, the trip by that line from Manchuli on the Russo-Chinese frontier can be done in 450 hours. An international railway conference will be held at Baden-Baden from October 12, and another will assemble in Berlin from October 22, the results of which will, it is expected, largely facilitate the journey to Western, Central and Southern Europe.

On the contrary, junctions toward the east of the Siberian railways are notably inconvenient. There are four routes. The Dairen-Changchung-Harbin line, the Kora-Changchung-Harbin line, the Vladivostok-Harbin route and the Vladivostok-Habarovsk line. All of these routes are inconvenient for tourists from Japan to the West of Europe. It was toward the autumn of last year that a Russo-Sino-Japanese railway conference was held in Moscow for the improvement of the railway junctions, but without success, owing to a dispute between the other two nations. Still, improvement in one way or other must be brought about. We would like to urge the Chinese and the Russian governments to render due efforts for this purpose.

Japan now stands in difficult circumstances in matters of international communications. Her shipping is being borne down upon by foreign competition. She has but few facilities on the continent. She has the South Manchuria Railway for international communications, but it is not sufficiently efficient. Japan is going to start an air

service, but she is far behind others in this respect. It is reported that some German business men will establish a regular air service connecting Berlin and Peking via Moscow some time the year after next. If this enterprise proves successful, it is quite possible to connect Tokyo with the cities of Western Europe. This distance can be covered within half the time required for the journey via the Siberian railway.

It is expected that some English and French air navigation companies will begin the business of regular services between Paris and Bagdad, and Bagdad and India, and also that Dutchmen have a similar project in contemplation. Japan must exert her utmost endeavors for a successful air flight service lest she drop behind others in this field of international competition. It should be noted that Japan will form the center of an international air communications route. Her position is advantageous, which must be skillfully utilized, but the present development of her aërial service is deplorably backward.

### *Naval Budget*

Japan *Advertiser,* 2 November.—The dispute between the navy and the Ministry of Finance over the size of the naval construction program, which is to be launched during the next fiscal year according to the provisions of the naval treaty, was settled Sunday afternoon, when both sides accepted the figure of 258,000,000 yen as the cost of the entire project, with the important condition that instead of four years, as called for in the navy plan, the whole work be completed in five years.

The figure at which the compromise was effected in the outstanding dispute represents the concession of the navy to the amount of 36,000,000 yen, and an advance of 10,000,000 yen over the amount which the Ministry of Finance offered as the maximum beyond which it could not go, without upsetting the whole budget plan.

The consent of the navy office to a reduction in the size of its construction project means the abandonment of the construction of five special duty ships and one gunboat.

#### AGREE ON PROGRAM

The program, finally agreed upon between the Ministry of Finance and the navy, which is subject to the sanction of the cabinet, calls for four 10,000-ton cruisers, sixteen 1,700-ton destroyers, one 2,000-ton submarine, four 1,700-ton submarines and three gunboats for use on the rivers.

Those ships which are to be dropped from the present program, according to the agreement of the Ministry of Finance and navy, are to be provided for in the second naval construction project, which is to be launched after 1931.

The settlement of the dispute, which threatened to cause a break in the cabinet, was made possible by the intervention of Premier Wakatsuki, who strongly appealed for an agreement. During negotiations which followed, the navy came down to 268,000,000 yen. The Ministry of Finance came up to 248,000,000. And intervention from the premier led to a final agreement at the figure of 258,000,000 yen.

### *Submarines*

*Revista General de Marina,* October 1926. [Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy.]—Submarines, in which Japan has put all her hopes for defensive warfare, just as she put all her hope for offensive war in cruisers, although at the cost of numerous accidents, continue to be in that country the preferred object of study. At present this arm of war is in a state of high efficiency, giving news of trials ceaselessly though without giving details. Lately much has been said about wireless experiments conducted under water among three submarines in the bay of Hiroshima, the base of Sasebo and Formosa, communicating at a depth of three feet and losing clearness upon adding to that depth. The new flotillas assigned to the school, which are Nos. 4, 11, 15 and 16, carrying officers of the Superior Naval War school, went out on June 25 on a long trip of two weeks, from Kune to Chinkai (Korea), through the strait of Simonoseki, to conduct studies and experiments. The new submarine *A-1,* carrying aboard commissions from the Submarine School, from navy sanitation and from the Department of Materials, made a cruise from Bako southward, a distance of 2,500 miles. [They must have reached the neighborhood of the Philippines, and it was no doubt the trip to which the press

made reference through error, supposing it concerned the coast of America], and as a consequence of this trip Lieutenant Sato said to the press that the results obtained from that test would be epoch making in the history of Japanese submarine navigation and that, thereafter, submarines would be able to operate more than a month at a time outside of the mother ship.

The *A-1* left Kure on April 24 and arrived at Bako on the twenty-eighth, leaving that port on the thirtieth and coming back to Kure on May 4. When the crews were weighed, it was found they had in general gained in weight. During this year's maneuvers of the squadrons in the Bay of Ise the record for rapidity in submersion was beaten. Until last year the record was fifty-five seconds; submarine No. 26 passed from running with its engines to disappearance under water in fifty-two seconds. Many experiments were made with messenger pigeons enclosed in a cylindrical box which opens automatically at the surface of the water after being cast out through a tube. Experiments were also made—and it said with good results—with anti-submarine nets, which were moored at the entrance of military ports, as was done during the war.

Although no grave accident has occurred for more than a year, the government has provided for the establishment of a new compensation, called "lump-sum," for the families of such as die in submarine accidents, such compensation being intended for fathers, sons, brothers, including grand parents and, in the absence of family, his heirs or to whomever the victim may wish to leave it. Said compensation is as follows:

10,000 yen for chiefs, officers, assimilated personnel and midshipmen.

5,000 yen for petty officers and assimilated classes.

3,000 yen for subordinate classes and all inferiors, including sailors, employees, and workmen.

The sum is collectible in one payment and death must occur in an accident at sea, not in a shop, etc.

They also have made obligatory the use of the German Thermo-Hygrometer to check up constantly the temperature and humidity of the air in the submarine.

The policy of that country with regard to submarines is clearly defined in a semi-official article published in a paper of the party in power, in which it is stated that the government of Japan, realizing that the development of the submarine since the Washington Conference of 1921 has been considerable in structure, tonnage and form, that the North American government has declared that it does not consider itself bound by the decisions that the conference may adopt preparatory to the limitation and that Russia would not attend the conference, and hence the doubt that any agreement in that respect would be reached; consequently she is decidedly opposed to abolishing the submarine. The government of Japan considers the use of that arm as inevitable in case one of the belligerants is inferior in ships of the line, and that the cruelty and inhumanity involved in the use of the submarine can be avoided or at least can be appreciably diminished if regulated by means of concrete stipulations.

## GERMANY

### *Germany Perfects New Style Rifle*

Japan *Advertiser*, 21 October.—The large list of German military inventions has now been lengthened by a rifle constructed on absolutely new principles, which will very likely entirely revolutionize present methods of warfare.

The new rifle uses compressed air instead of powder and is an automatic weapon firing twenty-five rounds in rapid succession. Its range exceeds three miles, at which distance the air-compelled projectiles still pierce completely armor plates one-eighth inch thickness. These bullets, which are very long-nosed and sharply pointed, possess a nozzle velocity surpassing by one fifth the velocity of the modern army rifle-bullets and are loaded into a long machine located underneath the barrel and given the rifle the appearance of the old Remington pump-gun.

The compressed air used is supplied in steel cartridges, one cartridge being sufficient for the discharge of 25 bullets.

With the exception of a weak whistling noise, the discharge of the air gun is absolutely soundless, which fact, however, constitutes only one of its numerous advantages. With this rifle, there will never be any scarcity of ammunition. The troublesome cleaning of the barrel immediately after use, to save it from the corrosive effects of powder, will be a thing of the past.

Even after 2,000 consecutive shots hardly any warming of the barrel is noticeable. There is no smoke and no flash; in the future wars, silent death will overtake men fighting noiseless battles.

### *Zeppelin Works Are Busy*

*Christian Science Monitor,* 17 November. —The Zeppelin works are busy building a new giant airship for a service between Spain and Argentina which will have a length of 250 meters, a breadth of thirty-one meters and a height of thirty-five meters. Since this ship is to be used primarily for passenger service, the captain's gondola and the passenger cabin will be separated from one another. In the *Los Angeles (ZR-III),* it will be remembered, they were in one. The ship will have seven engines, each in a gondola of its own. Work on the hull will be commenced in about five weeks, while the first trial flights are expected to take place in a year. The lighter-than-air people, however, will have to get busy if they wish to catch up with the heavier-than-air pilots. Not less than six pilots of the German Luft Hansa (air traffic company) here have now flown more than 3000,000 kilometers each in the course of the daily service. Each of them, therefore, has encircled the globe, in theory, almost eight times.

## ITALY

### *Chemical Warfare and Military Chemical Service*

*Revista General de Marina,* October, 1926. [Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy.] —Although as yet incomplete, the special organization recently effected in Italy of everything related to future chemical warfare will, it is trusted, be of interest to our readers. This organization not only demonstrates the importance attached in foreign countries to the study of these new elements by placing, under one special military administration, all the experience and resources of the country, but tends to be transformed in the near future into a ministry capable of organizing by itself the most violent offensive, in cooperation with the ministries of War, Navy, and Aëronautics.

We need not stop to comment on the legality of the use of gases, which goes so far as to transport the most deadly epidemic diseases that can affect non-combatant civilians and women and children; our mission is to give the sound of alarm as to how nations, notwithstanding all the international congresses called for the maintenance of peace, are preparing for attack and defense. We wish also to study these methods and try to develop and organize such of these elements as our nation possesses.

The chemical services of the different forces of Italy (Army, Navy, Aëronautic,) have been united and organized in conformity with a recent order.

The administration of the "Military Chemical Service and the special group will have its seat in Rome, and will consist of two offices for the director and assistant director. Three sections: the first of Chemistry; second, Physiopathology and Therapeutics; third, Technical and an Experimental Laboratory under the orders of colonels, lieutenant colonels of various arms. The special group will form a major staff, a special company with its administrative offices, with materials, an electromechanical laboratory, an office, a storage house and experimental grounds.

The head of the Military Chemical Service will be directly under the jurisdiction of the Ministry of War (under Secretary of State) and will have all the authority of the head of a corps.

We shall transcribe specifically the duties and jurisdiction of the heads and services:

The head of the Military Chemical Service:

Will give the organs subject to his jurisdiction the necessary encouragement to assure uninterrupted activity in study and application; he will direct and coordinate its operations, setting it in harmony with the ultimate institutional purpose of the service.

He will keep abreast with everything done or published with regard to his service both in Italy and abroad; he will estimate the value of the necessities that may be brought to light as a result of such study and knowledge, and will submit to the Ministry of War such propositions as he may deem useful and necessary to assure the proper operation of the service.

He will follow the development of the national industries and their various experiments and will propose to the Ministry of War all measures necessary to put them in proper condition with the view to assure the production of the necessary chemical elements of war when the time comes to make use of them.

He will supervise the technical preparation and training of the personnel at his orders or of such as are subject to being called to form part of the Military Chemical Service.

He will always be ready to make such studies and experiments related to the service under his jurisdiction as the general grand staff or the navy or aëronautic staff may deem fit to entrust to him, and to that end will organize special sections for the navy and for aëronautics.

He will participate in the drafting of instructions and regulations relative to the Military Chemical Service and of the orders concerning the mobilization and organization of special units.

For this purpose he will be constantly in communcation with the above mentioned staffs, with the inspector generals of the different arms and with the heads of artillery construction and of engineers.

He will be kept abreast by the three staffs, war, navy and aëronautics, of all that comes to their attention as having been done or published abroad. In due time, he will inform said staffs of the progress of the studies, experiments, and practical applications effected, and will address to them such requests and propositions as he may consider proper in order to obtain such knowledge as may be of interest to him.

He will be consulted by the above three ministries concerning the movements of the personnel employed or to be employed in the Military Chemical Service.

The Section of Chemistry will conduct the necessary studies and experiments with the view to define the nature of offensive chemical substances, fumigatory or incendiary, that will most probably be used by the various staffs; said section will furnish other sections with whatever they may need in order to carry out their special tasks; it will conduct tests of such chemical substances and materials as may be manufactured or acquired, and will be responsible for the quality of the products.

The Section of Physiopathology and Therapeutics will study the physiological action of chemical substances on the personnel and on animals, and the consequent anatomical and functional alterations on the various tissues, organs and systems; it will ascertain the proper treatment; it will help the other sections in studies and experiments having for their object to define the means of protection, individual and collective, as well as in the necessary tests to determine the efficacy of such means.

The Technical Section, in cooperation with the navy, aëronautics, the arms of infantry, artillery and engineers, will study and define the use of offensive chemical substances, fumigatory or incendiary. In addition, with the aid of the special group of the first and second sections and that of engineers, it will study and define:

The use of offensive chemical substances, fumigatory or incendiary, with means (gas bombs, projectors and other means for throwing gases at a distance, newly invented apparatus, etc.) different from those intended for the navy, aëronautics, infantry and artillery.

The means of protection, individual (respirators, autoprotectors, special clothes, etc.) and collective (advantages of the terrain, shelter, alarm signals, etc.).

It will investigate such elements of protection.

The commander of the special group will be directly under the jurisdiction of the head of the Military Chemical Service and will have over the personnel of his group the same authority as is conferred by the regulations on a battalion commander.

In conformity with the instructions promulgated by the head of the Military Chemical Service, the commander of this group will be engaged in:

The maintenance of experimental grounds and the conduct of experiments and practical applications that are of interest to the Military Chemical Service;

The development of special courses, with the cooperation of the personnel of the head of the Military Chemical Service, in conformity with the directions to be issued in due time.

The special group will be the depositary of mobilization:

Of the special organs that may be as-

signed to the different commands to engage in the use of chemical elements of war;

Of such special units as it may be necessary to organize for the use of chemical substances, with elements of the navy, aëronautics, artillery and infantry, in order to provide in the best possible manner for collective protection.

The special company will administer all the personnel of the special group and will furnish the headquarters of the M.C.S. and the offices of the special group with the personnel needed by each (assistants, clerks, stenographers, office orderlies, etc.).

The Office of Materials will have charge of the administrative operations, bookkeepers, and the maintenance and preservation of the various materials, chemical elements of war delivered to the headquarters of the service or of the special group, as well as of the administrative operations and bookkeeping of such work as it may be necessary to execute for the proper operation of the Military Chemical Service.

In the case of such studies, experiments and practical application as it may be found advisable to utilize the services of scientific institutions, of universities and the higher institutions, the head of the Military Chemical Service will take the necessary action with the rectors concerned, and the Ministry of War will give an account to the Ministry of Public Instruction of the agreements arrived at, for his approval.

If the Military Chemical Service should need, temporarily, to avail itself of the knowledge of some university professor or of a professor of a superior institution or of intermediate institution, the Ministry of War will request that of Public Instruction that such professor be put at the disposal of the military administration of the army.

The rules for recruiting the specialized technical civilian personnel necessary for the Military Chemical Service will be published with every announcement of the competitive examinations in question.

We need not stop to give minute details of an organization embracing ten chiefs, twenty-six officers, eleven assistants, and 170 individuals provided with necessary material and cattle, as we consider it more interesting to set forth the plans for mobilization of anti-chemical defense both individual and collective.

From the foregoing it is clear that chemical warfare requires an intensive preparation, and that we must not close our eyes to the danger and the magnitude of the problem, but rather that we should keep them open in order to bring to its solution the energy and resources devoted to it by other nations who are in a more difficult economic situation.

## NETHERLANDS

### *Dutch Gun Boats*

*The Engineer,* 20 October.—The Netherlands naval squadron in the East Indies is about to be reinforced by two gunboats, or sloops, of an interesting type. The *Flores* and *Soemba,* as they are named, were built respectively by the Fijenoord and Wilton yards in Rotterdam, both being launched in the summer of 1925. They are intended for patrol service in East Indian waters, and in case of emergency to act as guard boats to the minefields off Surabaya. We are indebted to our contemporary, *Het Schip,* of The Hague, for the following details of these vessels. The specification laid stress on certain essential features, such as (a) extensive cruising radius; (b) robust and simple propelling machinery; (c) shallow draught—not more than 3. 60 m.—with a view to river navigation; (d) handiness of maneuvering; and (e) roomy living quarters, adapted for long cruises in tropical waters. The military characteristics were to be: (a) An armament of three 5. 9-in. guns and one 3-in. gun, which would be sufficiently powerful to deal with torpedo boats, armed trawlers, or other small craft that might attempt to sweep up the defensive minefields; (b) moderate protection, viz., a strong steel deck, an armored conning-tower, and plating over the magazines; (c) a very complete system of subdivision. It was recognized that such protection would be of no avail against direct hits, but that is a risk which the gunboats share in common with large cruisers of the Washington Treaty class. A sea speed of at least 14 knots being considered necessary, the machinery was designed for an output of 2,000 indicated horse-power. The *Flores* on trial developed 2,086 indicated horse-power at 167 revolutions, equivalent to a speed of 14.987 knots.

In view of the heavy armament and other weights to be carried on deck, special provision had to be made for stability. The task of the designers in this respect was rendered more difficult by the stipulation that two of the 5·9-in. guns should be mounted forward, the second being superimposed to fire over the first. The principal measurements are: Length overall, 75·6 m.; length on water line, 74 m.; breadth, 11·5 m.; depth of hold, 6·30 m.; draught, 3·60 m.; displacement, 1,683 tons. Owing to the moderate speed accepted it was possible to install engines of small dimensions, leaving sufficient headroom for the armor deck, which is also worked over the magazines and steering gear. The oil bunkers are so arranged as to serve the purpose of anti-rolling tanks, and their low position keeps the metacentric height within moderate limits. The scantling is strong, but owing to limitations of space the double bottom could not be extended beyond the machinery spaces, and even there it is not carried up to the turn of the bilges. To minimize the danger of fire, steel decks are worked throughout, and the usual teak planking has been replaced by a non-inflammable material known as Triolin. The propelling plant consists of two triple-expansion engines, each nominally developing 1,000 indicated horsepower, taking steam from four Yarrow small-tube oil-burning boilers, fitted with Howden's system of forced draught. The twin propellers are three-bladed, with a diameter of 8½ feet. The rudder is of the Flettner type. The new Dutch gunboats are the first vessels of war to be equipped with this pattern of rudder.

The vessels appear to be admirable craft for their purpose, and the designers have succeeded in endowing them with powers of offense and defense well above the average for ships of such limited displacement. The armament is heavy enough to make them formidable antagonists even for a light cruiser, while the protective deck and the armored conning-tower, which account for 225 tons of the total displacement, would enable them to stand up to the fire of medium-caliber guns without undue risk. The equipment includes paravane sweeps for clearing a path through hostile minefields.

## SPAIN

### *Naval Program and Notes*

*Journal de la Marine, Le Yacht,* 30 October. [Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy.]—Recent events in Morocco have made Spain realize the insufficiency of its navy, so much so that a new building program for new craft has just been prepared, its main characteristic being that the recent suggestion for the building of an 8,000 ton cruiser of the *Admiral Cervera* type improved has made room for that of three cruisers of 10,000 tons.

An order of the Fourth of July, 1926, concerning a special budget of 3,454,000,000 pesetas has granted the navy the amount of 877 million pesetas distributed over ten years.

The amount of 175,000,000 pesetas is devoted en bloc to the naval bases of Mahon, Carthagena, Vigo, to the establishment of an aëronautic school at Barcelona; to the establishment of powder magazines at Carthagena, Cadiz, Ferrol; for the building of shops for the manufacture of torpedoes, for the acquisition of mines, nets, etc.

All the remainder, or 702 millions, is intended for the building of new craft: 1.—the completion of the three cruisers *Almirante Cervera, Cervantes, Principe Alfonso,* of six destroyers of 1,650 tons, of six submarines type *C* and of the motor-sailor *Sebastian-Elcano.*

2.—For the construction of three cruisers of 10,000 tons (95 million each, including munitions); of three destroyers, *Churro* type, of 1,650 tons at 17 million each); of twelve submarines *C* type (12 million each).

3.—For the construction of a certain number of auxiliary ships: two oil tankers of 7,000 tons; three patrol ships, 250 tons; mine dredgers and mine layers; and the establishment of an aviation school at Barcelona.

Already a new 30,000 ton dock has been begun at Cadiz and provisions are made for one of 60,000 tons at Carthagena; other docks will be provided at the bases of Vigo and Mahon.

There is a considerable effort to make the Spanish Navy the first of the smaller navies of Europe; a careful plan is noticed in the continuity of ideas.

National industry has in the last few years made some progress toward freeing itself from foreign industries for the supply of war material. The output of the steel works of Reinosa is increasing every year. The navy yards of Reinosa and Carraca (Cadiz) continue to make the latest types of cannon up to the caliber of six inches. The armament of the new cruisers is entirely manufactured in Spain.

The newspapers of the peninsula have made little comment on the new naval program. However, *El Debate* finds certain amounts insufficient for the purpose for which they are intended.

"For submerged mines," says this newspaper, "six million pesetas are allowed; yet 16,000 mines are necessary to mine the base of Cadiz alone, covering the sea area extending from Guadiana to Trafalgar.

"Each mine of 200 kilograms of trinitrotoluene costs about 6,000 pesetas; hence, with the credit allowed for the whole country, it is hardly possible to moor a tenth part of the mines required for the important commercial and military zone of Cadiz-Huelva-Seville.

"There are twelve million pesetas for the construction and purchase of mine layers, mine dredgers and patrol boats; considering the same base of Cadiz, one of the most important of Spain and perhaps the only one where it is possible to lay mines, the mine layers, in order to lay those 16,000 mines, will have to have a displacement of 3,000 tons and a speed of 25 knots; with the amount allowed, therefore, only one half of a mine layer can be bought.

"The large dock of Carraca and the one of Carthagena which will have to receive the cruisers of 10,000 tons (Washington type), the enlargement of the basin of the latter yard and the acquisition of new dredges for Carraca are so important for the Mediterranean policy that their solution ought not to be postponed; but the amount of 30 million is insufficient. The same is true of aviation, and there is a lack of appropriations for the replacement of artillery the life of which is short."

As will be seen, *El Debate* does not mince words in its criticism.

### NAVAL NOTES

At the end of September, the Italian training divison moored at Ferrol, being composed of the old cruisers *Pisa* and *Francesco-Ferruccio,* coming from San Sebastian. Our Brest correspondent gave their specifications at the time of their recent visit at that port. We shall not return to that subject. They were given a very sympathetic and brilliant reception in that great Spanish military port of the Atlantic.

In the same port, thirteen bolshevik ships have just recently moored successively during the first fortnight of October. They bore the names of *Ineg, Lombala, Karincka, Nadejda, Record, Vejilaff, Kaochalolf, Choina, Kem, Khalturin, Kaloieff, Yatonerane and Isiglominka.*

These ships had come from Cherbourg as last previous port and were bound for Odessa. According to their statement, they remained in the bay of Carino, near the entry of the port, in order to shelter themselves from bad weather and take water and some provisions. The crews were not authorized to land, and a launch of the administration of the port remained on watch near them. The steamer *Isiglominka* alone was allowed to enter the port to take 200 tons of water, and left immediately afterward.

## ENGINEERING

### *Electric Welding*

*Christian Science Monitor,* 7 November.—Not only is the penetrating clangor of the riveter on structural steel silenced by the electric welder, but the process appears to be successful and, in some instances, superior, it is indicated by Buildings and Building Management in reporting on recent tests of welded steel joints at the Carnegie Institute of Technology at Pittsburgh.

"The results are so gratifying to those concerned," says the report, "that the suggestion is made that . . . . steps should be taken to revise the building codes of large cities in order to recognize and authorize welded framework under suitable specifications."

"One of the most striking things developed by the tests," said this periodical, "is the strength developed by these welded joints—a strength that surpasses in most

cases the ultimate strength of the members joined.

### Comparative Tests Succeed

"Another remarkable fact is that all comparative tests of similar specimens (that is, of specimens made up of identical members, connected in one specimen by welding and in the other by riveting) gave results decidedly favorable to the welded specimens.

"If these are normal results for this method, considerable saving in weight of steel used in the structural framework of buildings seems attainable."

The tests were carried out with great care both as to applying the loads and selecting the material from which the specimens were made. They appear to demonstrate conclusively, according to the article, that:

"Welded joints can be constructed in such manner as to develop fully the ultimate strength of the structural members connected.

"Beams and girders can be connected to columns so as to produce absolute fixation.

"Lines of beams or girders can be connected so as to provide complete continuity across the supports, whether the supports be girders or columns.

### Sustain Greater Load

"A steel I-beam of given section and length will sustain a far greater load if fixed at its ends by a suitably designed welded joint than if supported by standard riveted connections consisting of top and bottom angles. A nine-inch standard I-beam framed between rigid upright columns eight feet apart by means of specially designed welded connections sustained a load 25 per cent greater than a beam of the same size and length framed between columns by means of riveted top and bottom angles of one-half inch thickness.

"A plate girder assembled by welding, and consisting of nothing but sheared plates, has a far greater bending strength than a riveted plate-and-angle girder of the same weight, due to the better distribution of the steel in the cross section. A 15-inch plate girder assembled by welding and simply supported on a 14-foot span developed more than 50 per cent greater strength than a riveted plate-and-angle girder of the same depth and the same weight.

"A tension member, such as is used in trusses, connected at the ends of welding, can sustain a greater load than a member with riveted end connections but otherwise identical. Comparative tests of such hangers resulted in failure by tension of the welded member at a load 30 per cent greater than that at which the riveted member failed."

### More Than 20 Specimens Tested

More than twenty specimens were separately tested by means of an Olsen testing machine of 400,000 pounds capacity, says the article. Each speciment was loaded to failure and its yield point, or elastic limit, and ultimate load was determined.

"The welded joints designed and made for these tests are identical with the joints used for the new Sharon Building of the Westinghouse Electric & Manufacturing Company, the structural framework of which is now being fabricated and erected by the American Bridge Company.

"They were designed by Gilbert D. Fish, consulting structural steel engineer, in cooperation with the arc-welding engineer of the Westinghouse Company.

"The adoption of welded connections for the structural framework of this building and the carrying out of these full scale tests are due to the influence of W. S. Rugg, vice-president of the company in charge of engineering, who has given much attention to the possibility of arc-welded steel structures.

"The work of testing was done at the Carnegie Institute of Technology under the direction of J. M. Daniels, instructor in charge of the materials testing laboratory; A. M. Candy, welding engineer of the Westinghouse Company, and C. T. Eakin of the material and process engineering department, directing the actual welding process and the recording of results.

"Those in charge of the tests point out that the amount of weld metal used in the joining of members was intentionally made to exceed the amount actually necessary. This was done because the main purpose of the tests was to prove conclusively that arc welded joints can be made stronger than the members joined. It is their purpose to carry out further tests so as to determine the minimum amount of weld metal that will secure the requisite strength."

***Radio***

[*L'Elettrotechnica,* 15 October. Review and comment on an article written by H. Rukop "Experimental results of Radio-Telegraphy with short waves" *(Telefunken Zeit,* January, 1926, Vol. VIII, No. 42).—Translated by Assistant Professor Henry Bluestone, U. S. Naval Academy].—The radio profession has been surprised these last two years by the strength gained by short waves in trans-oceanic traffic. It was believed that only long waves were adapted to overcome long distances, and, in fact, according to the well-known formula of Austin, there is a great advantage for the intensity of the electric field if the length of the wave is about one 500th part of the distance between the two stations.

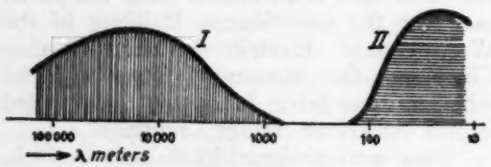


FIG. 1

In Diagram I, Fig. 1, is shown exactly, qualitatively, the manner of variations of the electric field produced at a given trans-oceanic distance by a given sending station (with due hypotheses concerning the latter) upon changing the wave length.

For instance, between Nauen and New York (6,000 kilometers) the wave of 12,000 meters has been pronounced good. On the other hand, waves under 1,000 meters have been found particularly unfavorable.

In the last decade, it was not even suspected that it was possible to effect communication over such long distances with waves under 100 meters; yet it is precisely these waves that have been gaining ground during the last two years, thanks to their indisputable merits. Their discovery is due mainly to accident. In America, wave lengths ranging below 125 meters were assigned to such amateurs as wished to undertake also the sending of messages, this being done in the belief that they would not thus be able to disturb anybody. Soon, however, it was shown that these short-wave messages could be received at great distances, for instance in Europe, even when relatively low power was used (½ kw.) Thereafter, short waves attracted general attention, and, in all laboratories, experiments were instituted with the view to discover the laws of propagation.

After all, the reasons for this delay are to be found in the very history of radio-telegraphy. It is only with the perfection of the electronic tubes that the transformation of energy at such high frequency was rendered possible. All other frequency converters are not adapted to the generation of frequencies of three million and beyond.

Likewise the "Telefunken" together with the "Transradio," particularly interested in long distance radio-telegraphy, soon initiated at the Nauen station, experiments the report of which forms the subject of the present article. Messages were received from stations of Buenos Aires (12,000 kilometers), Bandoeng, Giava (11,000 kms.), Osaka, Japan (9,000 kms.). The experimental material so gathered is of special interest for the study of short waves and their behavior under the influence of different variables, such as time of the day, seasons, wave length, etc.

Before entering upon the main argument, the author explains the difference in physical behavior of short waves as compared with long waves. In short-wave communication, the following phenomena are specially observed: the sudden fading of signals, the difference in power of signals between day and night, the existence of favorable waves in the immediate vicinity of which there can be particularly unfavorable waves, the variation of favorable waves with the hour and season and, finally, the confirmation of the existence of what are known as almost dead zones. After these results, there is no longer any doubt that, besides the series of long waves (Fig. 1, curve I) there exists another favorable series with wave lengths below 100 meters (Fig. 1, curve II), that, therefore, between the two there is interval inadaptable to long distance signaling. Austin's formula is not valid for the second group. His formula presupposes the propagation of the waves along the surface of the earth, while the short waves have the property of crossing the upper layers of the atmosphere in addition to propagating along the surface of the earth. The phenomenon observed is illustrated in Fig. 2. In the vicinity of the transmitting antenna *S* there is zone *A* of direct propagation, which conforms to Austin's law. Behind

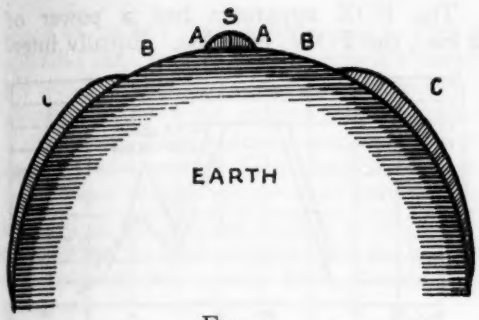


FIG. 2

it is zone *B*, of practically zero intensity on account of absorption. But an appreciable part of the energy radiating at *S* is propagated across the upper atmospheric layers and returns to the surface of the earth in zone *C*. This phenomenon was ascertained by many experimenters. It has been found that the dead zone *B* varies in extent according to the length of the wave. For waves of 15 meters it may exceed 1,000 kilometers; for waves about 40 meters, it may extend from 100 to 200 kilometers; for waves above 50 meters, the dead zone does not exist, because the zone of direct propagation *A* is extensive enough to border upon or even to overlap that of reflexive propagation *C*. Zone *A* is characteristically distinct from zone *C* because, in the latter, the waves have a diffused character and not a polarized nature as in the former. It is, therefore impossible to obtain radiogoniometric data. Various theories have been advanced for the explanation of this phenomenon. Of these the most acceptable is the theory that the rays of energy are curved in the upper layers of the air and precisely in the known layer of Heaviside, in which the constant dielectric ought to be smaller than in the atmosphere and therefore, owing to the higher conductivity of the medium, the velocity of propagation (phase velocity) ought to be greater and cause the curving of the rays toward the base. Inasmuch as this phenomenon must be dependent on frequency, we can see the explanation of the difference in behavior of the short waves with reference to the long.

*Tests in Nauen-Buenos Aires Transmission.*—In the traffic with Buenos Aires, notwithstanding the considerable power employed, the long waves furnished rather uncertain service. The Telefunken therefore tried to replace them by short waves. The first apparatus had two triods in parallel of 1.5 kilometers each. The triods were of a type specially constructed for high frequency with low autoinduction in the conductors and with electrodes capable of enduring strong, heavy currents that may reach even 20A. The antenna was of the single wire type, 100 meters high. The results were surprising. The messages were received in Argentina from the very first day, although the plant was provisional.

This apparatus received the name of POX and later that of AGA. Other apparatus were successively constructed: one, similar and of the same power transportable on a dray, was designated as POF, was intended for quick changes of place for experimental purposes, furnished with a collapsible [removable?] post on which was hoisted a tubular aëro twenty meters in height. Another similar apparatus, named POY, was installed in the main building of the station, and finally a fourth was constructed provided with two damped triods, capable of furnishing 16 kw. of power at high frequency. These apparatus operated at the beginning with a wave of 70 meters, shortened afterward, on several occasions, down to 13 meters. It was found that the waves favorable for communication with Buenos Aires were between 25 and 16 meters. The author finally illustrates the results obtained by numerous curves. In Fig. 3, for instance, he shows the intensity of receiving from a sending station located at a distance of 1,000 kms. from Geltow

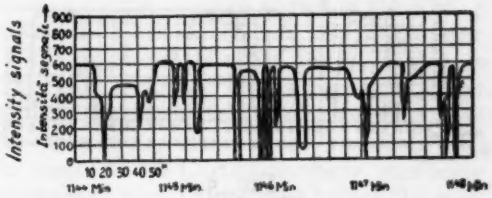


FIG. 3

[receiving station of Nauen] during four minutes. He shows the average intensity of the signals, which is almost constant, and the sudden diminutions due to fading. Fig. 4 represents the results of receiving effected at Buenos Aires from Nauen (12,000 kms.). The ordinates are the intensity of the signals and the abscissas are

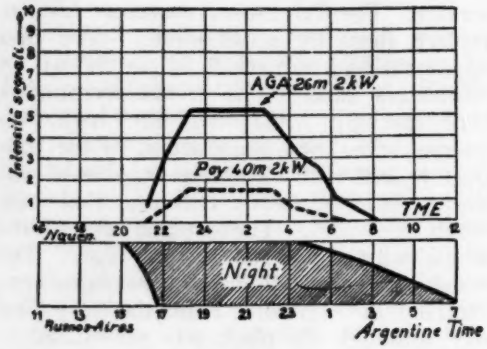


FIG. 4

the time. Above is shown the average European time; below the corresponding Argentine time. The difference between them is five hours. The space between two abscissas, each of which represents a place, represents the Nauen-Buenos Aires transit. The shaded zone indicates night at the given point of transit. The border line to the left of the shaded zone means sunset; that to the right, sunrise.

It will be seen from the diagram that during the day the intensity of the signals at Buenos Aires was zero; when half of the distance was already in the dark, the signals began to be heard, then they increased with the increase of darkness, during which they remained almost constant; then, afterward they began to diminish successively when half of the distance was already in daylight after sunrise. The two apparatus of equal power were sending at the same time, one with a wave of twenty-six meters and the other forty meters. The difference in the

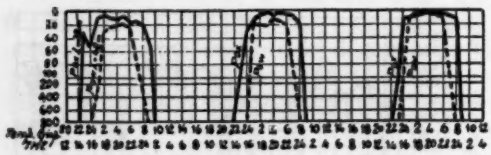

FIG. 5

results can be seen. Fig. 5 shows clearly the superiority of the 26-meter wave compared with that of forty-two meters in a series of experiments effected with Osaka, Japan.

The diagram extends over three consecutive days. The ordinates of this one refer to the resistance in parallel on the telephone of the receiver.

The POX apparatus had a power of 2 kw.; the POW, of 8 kw. Equally inter-

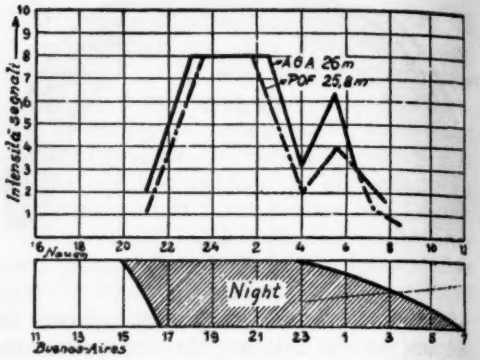


FIG. 6

esting are the curves of Fig. 6, obtained from a Nauen-Buenos Aires transmission with two apparatus of about equal wave length.

The author concludes by saying that, in view of the extreme variations in experimental results it cannot yet be established which are the most favorable waves for communication between two points at any hour or season. The variables that influence propagation are too many to render systematic calculation possible. What is certain is that, by numerous tests continually changed, they succeeded in establishing a reliable night traffic between Nauen and Buenos Aires, even under difficult conditions when all other stations did not succeed in effecting communication. Waves below forty meters have shown themselves better adapted than those between 100 and 40 meters. Particularly favorable are those about 18 meters. It is to be observed that for the receiving of these waves atmospheric discharges cause little interference.

## AVIATION

### *Italy's Splendid Victory*

*Aviation,* 22 November.—What was in many respects the greatest seaplane contest ever held was the race for the Jacques Schneider Maritime Cup last Saturday at Norfolk, Virginia, in which Italy defeated the United States in a masterly race during which many seaplane speed records were shattered by both the Italian and the American planes. Major Mario de Bernardi, who won the much-prized trophy at an average

speed of no less than 246.496 m.p.h. flew a splendid race, but his success was not purely his own. It was the result of the concerted efforts and untiring energy of the entire Italian team, from mechanics upwards, who came to this country with three almost untried speed planes which were very nearly as novel to the Italians as they were to ourselves when we first set eyes upon the beautiful lines of the speedy little Macchi-Fiat machines.

Italy won because her planes were aërodynamically faster than were ours; her engines were more powerful; and her pilots, among the finest in her country, and her mechanics, together worked in unison as one body. Her team work was remarkable and had become a most noticable feature to everyone who went to Norfolk for the race. These accumulated factors all worked together to spell success to her team and the Italians now prepare to carry back to Italy a trophy which they came over to win and which they will now undoubtedly guard with justifiable pride.

From the American standpoint, the Schneider Cup contest has not been lost without many lessons being learned, the value of which will depend entirely upon the extent to which we heed these lessons. In many respects it may be said that the United States has been beaten at her own game. This country has held the world seaplane speed honors ever since Lieutenant Rittenhouse first captured the Schneider Cup from the British at Cowes, England in 1923. Her challengers for these honors have not until now met with much success. Possibly we have been led to sink into the misconception that we needed no special effort on our own part in order to hold this trophy and that the development of our new engines this year would be sufficient to defeat successfully all challengers.

But there is more to it than this. One branch of our air services obviously cannot be entrusted with the defense of our laurels in the air. Last year the Navy's activities in the Schneider Cup contest, quite apart from the fact that she did not win, were a failure. This year conditions were even worse. The Navy looks upon the Schneider Cup contest as a means of training her personnel, as was characterized by the fact that two of our best racing pilots, Navy men, stood by, while a pilot of unquestioned ability but with little or no racing experience was permitted to wreck one of our best planes and narrowly escape with his own life. To win in the future the personnel of both Army and Navy must be made available.

All this points strongly to the fact that it is in private enterprise that we must expect the greatest success. The Italian Air Department, under the direction of Premier Mussolini, ordered the three Macchi racers but left the development of the planes and the management and organization of their national effort in the hands of private enterprise. The race organization was entirely in the hands of the Macchi and Fiat concerns whose products were at stake. Their crews worked in unison. As already mentioned, their cooperation was remarked on by everyone. Italy won the Schneider Cup because of the keen determination of private enterprise. The Italian Government has bought with its money the international prestige in the air which it gained on Saturday when its subjects put up so remarkable a performance.

The United States can, and probably will eventually, do likewise. Some indication of the success which may be gained from the encouragement of private enterprise is even to be found in the details of our preliminaries for the Schneider Cup contest. Two of America's chief aircraft engine manufacturers were to have had their respective power plants in the race. The Curtiss company was entrusted with the installation of the new Curtiss V-1550 engine in the *R3C-4* racer, while the installation and adjustment of the Packard 1A-1500 geared engine in the *R3C-3* racer was left to the Navy. What actually happened has a strong bearing upon the point under discussion. The *R3C-4*, in the hands of the Curtiss company, was being extensively tested some time before the race. Little real trouble was experienced with the plane and engine, while it remained in the hands of the Curtiss company. On the other hand, unofficial world seaplane speed records were set up during the test flights of the plane.

Now, take the case of the Packard-engined plane in the hands of the Navy. Little was heard of the machine and no details of any kind were forthcoming before

the contest. No results of test flights were announced and it is known that considerable trouble of one kind and another was experienced. Yet the Packard 1A-1500 engine is a tried power plant which is in constant service use and has proved itself as one of the very finest high-powered engines in the world. Here, then, may be visualized the two opposites in procedure. Which should we choose in the future?

We need to win the Schneider Cup back from Italy. We need it for our international prestige in the air and we need it as a stimulant of our technical development in aëronautics. Considerable thought, however, must be given to the method of our organization in the future.

***The Durability of Metal Propellers***

*U. S. Air Services,* November, 1926.—Ever since metal propellers have come into practical use, there has been much speculation as to their life. It is a well-established fact that metal is subject to fatigue under certain stress conditions, but whether or not duralumin propellers would be affected by such conditions, and if so, how soon, has been a question of which little was known.

During the past three years more than a thousand metal propellers have been built in the United States, and the great majority of them have piled up records of hundreds of hours of service without signs of trouble. Recently, however, failures of three metal propellers have caused a certain amount of comment and apprehension among pilots, and a careful study has been made of these failures, both by the manufacturers and by technical bureaus of the government.

Two failures occurred on single-motored machines with flying time of several hundred hours, and one on a comparatively new propeller. This latter failure, however, occurred on a tri-motored machine where the propellers had considerable overlap. It has long been recognized that the overlapping of propellers causes undue strain because of the varying forces of the slipstream. United States military practice, as well as general European practice, discourages such construction. Therefore, as applied to the general problem, this failure can be discounted, as it is an open question whether any propeller can be made strong enough to withstand the stresses caused by overlapping.

The other two failures apparently occurred from metal fatigue. Other propellers that were later examined also showed cracks from the same cause. It must be noted, however, that both the actual and incipient failures occurred after long service, and on propellers which were among the first manufactured. As is natural, many improvements have been made since then, all of which tend to strengthen the propeller. For instance, on the early propellers the hub bolt holes were not chamfered, but were left with sharp edges. Engineering tests later proved that such sharp edges weakened the propeller, and this was further substantiated by the fact that all cracks so far discovered originated around these holes. Chamfering has become standard practice on all propellers and can be done easily on the old ones. While this may not eliminate the trouble entirely it will unquestionably lengthen the life of the propeller.

In connection with the failures above referred to, the following quotation from a technical note of the National Advisory Committee for Aëronautics on the "Care and Adjustment of Metal Propellers" will be of interest: "There have been failures of propellers of this type, although, as far as is known, they have been very few in number and limited entirely to the first few propellers manufactured. It is confidently believed that no difficulty will be experienced with them in the Army or Navy. One case of failure occurred on an air mail plane. The propeller had had 667½ hours of satisfactory flying without showing any signs of trouble and then broke in the air. Both blades tore away from the central portion.

"A careful examination of the broken blades made by the Bureau of Standards reveals that the break was a typical fatigue fracture and took place across the hub bolt holes. This area of the propeller is covered by the hub blades and therefore would not be visible unless the crack extended to the edge of the blade."

Examination of several propellers has definitely established that they do not break all at once, but start to crack progressively, and that in the early stages these cracks can not be detected by ordinary inspection methods. Therefore there has been developed a practical process of inspection,

known as etching, which can be done on the field and which will show up clearly even the smallest cracks. The etching process consists of bathing the central portion of the blade, where the bolt holes are located, with sodium hydroxide, and later wiping off with nitric acid. This cleans and slightly etches the blade, and shows up very clearly any cracks that may have started. Periodic inspection by this method, therefore, will assure the operator that his propeller has not started to develop fatigue failure.

The above mentioned improvements and inspection will relieve the present situation, and it is believed that the present type of propeller will continue to be entirely satisfactory for certain types of motors and ships.

It must be remembered, however, that the twisted slab type of propeller, (the type referred to in the above discussion) was developed to accommodate the old type of war surplus propeller hub, primarily designed for attaching a wooden propeller to the crankshaft. The use of these old hubs greatly reduced the price of the propellers—so that the twisted type of propeller was really an economic and emergency measure, rather than the ideal type. Present military procurement practice in the purchase of motors eliminates the old style hub. This has stimulated the design of a new type of propeller with a solid forged hub which can be directly attached to the crankshaft.

Such a propeller has been under development for some time. It was first used, with complete success, on the 1925 Pulitzer and Schneider Cup Racers that were built for the U. S. Army and Navy. The manufacture of this type for both military and commercial use is being expedited in every possible way, and production on a quantity basis is promised for the very near future. It has been established that the new type is superior to the twisted type in all respects and it is believed that it will prove to be the ideal propeller—one which can not fail under normal operation.

### *Introduction to Report of Conference on Aeronautical Nomenclature*

The nomenclature for aëronautics presented in this Report No. 240 is a revision of the last previous report on the subject, which was issued in February, 1923.

This Nomenclature for Aëronautics was prepared by a special conference on aëronautical nomenclature authorized by the executive committee of the National Advisory Committee for Aëronautics at a meeting held on August 19, 1924, at which meeting Dr. Joseph S. Ames was appointed chairman of said conference. The conference was composed of representatives of the National Advisory Committee for Aëronautics, and, in response to the committee's invitation specially appointed representatives officially designated by the Army Air Service, the Bureau of Aëronautics of the Navy Department, the Bureau of Standards, the American Society of Mechanical Engineers, the Society of Automotive Engineers, and the Aëronautical Chamber of Commerce.

To facilitate the work of the conference the entire nomenclature was divided into four main sections, and a subcommittee was appointed to study and agree upon the terms for each section. These four subcommittees, with their officers, were as follows:

Subcommittee on Aërodynamic Terms.—Dr. Joseph S. Ames, chairman; Commander H. C. Richardson, United States Navy, vice chairman for airplanes and airplane parts; Dr. H. L. Dryden, vice chairman for aircraft instruments; and Professor Edward P. Warner, vice chairman for maneuvers and general aërodynamics.

Subcommittee on Airship Terms.—Mr. Starr Truscott, chairman.

Subcommittee on Power Plant Terms.—Mr. G. W. Lewis, chairman.

Subcommittee on Airway Terms.—Lieutenant St. Clair Street, United States Army, chairman.

On completion of the reports of these four subcommittees, they were considered by the entire conference at a final meeting, and on recommendations of the conference the complete nomenclature was officially approved by the executive committee of the National Advisory Committee for Aëronautics on September 19, 1925.

This report supersedes all previous publications of the committee on this subject. It is published for the purpose of securing greater uniformity and accuracy in the use of terms relating to aëronautics, in official documents of the government and, as far as possible, in technical and other commercial publications.

The organization of the conference on aëronautical nomenclature was as follows:

CONFERENCE ON AËRONAUTICAL NOMENCLATURE

DR. JOSEPH S. AMES, *Chairman*

*National Advisory Committee for Aëronautics:* Mr. G. W. Lewis, Professor Edward P. Warner, Mr. Thomas Carroll, Mr. Marsden Ware.

*Air Service of the Army:* Major Harold A. Strauss, U.S.A., Captain Gerald E. Brower, U.S.A., Mr. E. T. Jones, Captain R. L. Walsh, U.S.A., Lieutenant St. Clair Streett, U.S.A.

*Bureau of Aëronautics, Navy Department:* Commander H. C. Richardson, U.S.N., Dr. A. F. Zahm, Commander E. E. Wilson, U.S.N., Lieutenant W. S. Diehl, U.S.N., Mr. Starr Truscott.

*Bureau of Standards:* Dr. H. C. Dickinson, Dr. H. L. Dryden.

*American Society of Mechanical Engineers:* Dr. W. F. Durand.

*Society of Automotive Engineers:* Mr. Grover C. Loening (also representing Aëronautical Chamber of Commerce), Mr. W. B. Stout, Mr. R. H. Upson.

*Aëronautical Chamber of Commerce:* Mr. S. S. Bradley, Mr. Ladislas d'Orcy, Mr. George Mead, Mr. Arthur L. Nutt, Mr. Grover C. Loening (also representing Society of Automotive Engineers).

## MISCELLANEOUS

### *A Letter from the Secretary General of the International Hydrographic Bureau*

MONACO
15th November 1926.

SIR,

I have the honor to report as follows on the elections of the new Directing Committee and Secretary-General which took place at the Second International Hydrographic Conference which was held at Monaco, from October twenty-sixth to November tenth 1926.

There were seven candidates for the posts of members of the Directing Committee of the Bureau, viz:—

Proposed by:

Captain Björset, E. S., Norwegian, Norway and British Empire.

Captain Chryssanthis, A., Greek, Greece.

Rear Admiral Hoseman, German, Germany.

Rear Admiral Niblack, A. P., U. S. of America, U. S. of America.

Rear Admiral Phaff, J. M., Dutch, Netherlands.

Captain Tonta, L., Italian, Italy.

Ingénieur-Hydrographe en Chef de Vanssay de Blavous, French, France and British Empire.

On November fifth the nomination of Rear Admiral J. M. PHAFF, the President of the Directing Committee, was withdrawn for reasons of health.

The election took place on the afternoon of November sixth with the following result:—

Rear Admiral A. P. Niblack, U.S.N. (Retired), 241 points.

Monsieur de Vanssay de Blavous, French Navy, 204 points.

Captain L. Tonta, R. I. N. (Italian), 147 points.

Captain E. S. Björset, R. Norwegian Navy, 125 Points.

Rear Admiral Hoseman, German Navy, 42 points.

Captain A. Chryssanthis, Greek Navy, 40 points.

Rear Admiral A. P. Niblack, U.S.N., (Retired) having received the greatest number of points, was elected president, and Monsieur de Vanssay de Blavous and Captain L. Tonta, members of the Directing Committee of the Bureau, for the next five years.

Commander G. B. Spicer Simson, R.N., D.S.O. being the only candidate for the post of Secretary General, he was elected by acclamation.

I have the honor to be,
Sir,
Your obedient Servant.
G. B. SPICER SIMSON,
*Secretary-General*

### *Uniformity in Navigational Aids*

*Marine Journal*, 20 November.—Mariners should receive every help that it is feasible to give them in the way of navigational aids for guiding and safeguarding their vessels, and the resources of science and engineering should be used to provide for them the

most efficient lights, fog signals, and buoys. Maritime nations have long striven to do this. The extensive buoyage and lighthouse systems that have been developed are maintained solely for the benefit and protection of marine navigation, and in doing this the mariners' needs and views have received first consideration.

To this end it is evident that buoys, lights, and fog signals should have characteristics such that each navigational aid will be distinguished not only from other aids, but from signals for other purposes, and also so far as practicable, that each aid should have characteristics indicating to the navigator the location or direction of the safe channel and of obstructions. In order to avoid confusion, it is obviously desirable to use simple characteristics, and to have uniformity of system as to the meaning of these characteristics. As a large portion of maritime traffic is international, and vessels must use the navigational systems of various authorities, the need of some degree of understanding and uniformity as between countries is apparent. Because of practical difficulties it will not be possible to obtain a theoretically perfect system. This subject has received consideration for many years, and important progress has been made. Because of recently renewed interest it is desirable to review the situation, as without full understanding there is a danger of backward steps being taken.

An important advance towards international uniformity was made at the International Marine Congress at Washington, in 1889, at which twenty-eight countries, including nearly all the principal maritime nations of the world, were represented. Among other actions, it was determined by this congress that, for a mariner entering from seaward, buoys defining the starboard hand shall be red, those defining the port hand shall be black or particolor, and those defining middle grounds shall be painted with horizontal bands. This covered the feature as to which it is most desirable to have agreement, and this color arrangement has come into very wide use throughout the world.

### Attempts at Similarity

At another international maritime conference, held at St. Petersburg, in March, 1912, the subject of uniformity of buoyage was again considered. Among other conclusions, this conference adopted the report of a committee which expressed the view that signals left to starboard by the navigator coming from seaward should be black, and those left to port should be red. As this was a proposal for a direct reversal of the system adopted at Washington twenty-three years earlier, it becomes important to examine the circumstances and significance of this action. The St. Petersburg Conference was attended by only sixteen countries, and Great Britain and some other principal maritime nations were not represented at all. The committee which made this buoy recommendation did not include in its membership representatives from any one of the four countries which maintain the most extensive buoyage and lighting services. By far the most important action taken at this conference was this proposal for the reversal of buoy colors, but the records do not indicate that serious effect of this proposal on the countries with extensive buoyage systems was either brought out or appreciated. The resolution was adopted at the second session of the conference. In the case of the United States the authorities responsible for the buoyage and lights did not even know that such a topic was to be discussed until many months after the St. Petersburg Conference had been held. While speaking highly of the zeal of the delegates, the American representative reported that he did not know the questions to be discussed until the opening of the conference, and that the majority of the members felt that the questions proposed were of far too great importance to be settled in the short space of time available. The only explanation of the proposal for the reversal of buoy colors is that stated in the resolution itself, to the effect that it was recommended because most countries were using green lights on the starboard hand of channels entering, and red lights on the port hand. It was unfortunate that there was not fuller consideration and more complete information, as this statement was not correct. Countries giving preference at present to this color scheme for lights have only about 3,300 out of the 18,000 navigational lights of the world or about 18 per cent only, while countries which give preference to red lights with red buoys on the starboard hand enter-

ing, and white lights on the port hand, have some 7,100 lights, or about 39 per cent. The comparison in 1912 could not have been less favorable to the latter system.

### MINORITY RULE

It is not surprising, therefore, that the St. Petersburg suggestion for the reversal of buoy colors has been quite generally disregarded throughout the world. At the present time, after 14 years, only three countries, having about 700 buoys, have followed the suggestion of the St. Petersburg Conference, these representing about 2 per cent of the 30,000 buoy stations of the world. Countries having about 24,000 buoy stations, or 80 per cent, are using the red and black buoy colors in the manner determined at Washington in 1889. The remaining countries, with about 5,300 buoys, use the cardinal system, or some mixed system, for the most part conforming in some degree with the Washington Conference decisions. In view of this situation, an extended review of this action of the St. Petersburg Conference would appear to be unnecessary now, were it not for the fact that after lying dormant for a long time, it has within the last two years been actively brought forward as a main reason for extensive and radical changes in buoyage systems. As for this country no one has ever even suggested to the Lighthouse Service that an attempt be made to reverse the red and black buoy colors on the coasts of the United States.

Recent proposals have gone much further, and include substituting green for black buoys, and the placing of green lights and green buoys on the starboard hand entering, and red lights and red buoys on the port hand entering. Aside from the practical difficulty of carrying out so sweeping and radical a change in the buoyage and lights of the world, this plan is subject to serious objections, based on the principles of lighthouse engineering. It would largely eliminate the white lights as an entrance or channel light, although the white light is more than twice as efficient as the green. For this part of the lighting system it would use mainly the two colors used for ships' running lights, and would thus increase the likelihood in congested waters of confusion between lights on ships and on navigational aids, a serious objection even though the latter are mostly flashing. It conflicts with the use of green for marking wrecks, adopted by nearly all countries (although not by the United States). It introduces green for the painting of buoys, and consequently also of beacons and daymarks (which should conform to the buoy coloring), although green is less effective than black against a background of trees or vegetation or of sea water.

### COLOR UNIFORMITY DESIRABLE

Uniformity throughout the world in the use of red and black colors for buoys on the sides of channels would be very desirable, and this is the most important item in any program of uniformity. Such uniformity has already been nearly reached as a result of the Washington Conference of 1889. It is not likely that a reversal of a system so generally adopted, and now in convenient use, can be brought about, and no adequate reasons have been advanced to justify the expense, confusion and danger that would be entailed in attempting to reverse these extensive buoyage systems. Action on the part of countries towards reversing the present standard practice of the world, red on starboard in entering and black on port, would result in introducing confusion rather than uniformity in buoyage, and would further postpone the getting together of the nations for the benefit of the mariner.

Probably the next most desirable item in uniformity of aids to navigation would be to have standard colors for lights on the respective sides of channels. But the difficulties in attaining this are much greater than in standard buoy colors, and are so great that no international conference has as yet proposed such standard colors for lights, and apparently few countries even within their own limits have followed a rigid system. As stated above, a group of countries, all in Europe, are giving preference to colors for channel lights conforming to the ships' running lights for a vessel entering; in the present status, however, this has the objection of placing the red light on the opposite side of the channel from the red buoy, and also in tending to eliminate the more efficient white light. Countries operating a much larger proportion of the lights of the world have long been given preference to

placing red lights with the red buoys on the starboard side entering, and white lights on the port side with black buoys. The fact has been quite overlooked in the discussions abroad, that red lights are in extensive use now to mark the starboard hand entering, thus avoiding the illogical arrangement of having the red light and the red buoy on opposite sides. As this is today in much more extensive use than any other system, and as no international action has even been taken as to colors of entrance or channel lights, it should be possible to reach an understanding as to a recommended system, with a view to its being favored as opportunity offers, throughout the world, even though it may not be practicable for countries to rigidly follow it.

The Washington Conference also adopted the conical form for starboard hand (red) buoys, and the can or spar form for port hand (black) buoys, and this was also recommended at St. Petersburg, and excepting as to spar buoys is followed by most countries. Form has an important advantages over color in its permanency and visibility under varying conditions, and particularly under conditions of low visibility. It cannot well be universally depended upon for distinctive purposes, hovever, because of the extensive use of bell, whistle, spar, and lighted buoys, to which this distinction is not readily adaptable, but the subject is one worthy of further study; as to spar buoys there is a definite trend in this country towards their elimination and replacement by iron buoys.

The Washington Conference adopted as an alternative a compass or cardinal system of colors for buoys, which has been followed in part by a few countries with complicated coasts; in this system the buoys are colored according to whether they are on the north, south, east, or west side of the channel. The colors red and black are used, and if there could be full uniformity in the application of these colors, this system would not necessarily conflict with the use of red and black buoys in the lateral system, but rather be an extension of it to meet special conditions. For a few channels on the coasts of the United States it has been necessary to adopt arbitrary rules as to which shall be considered the entering direction.

### Congressional Mandates

It was fortunate for shipping in the United States, that Congress as far back as September 28, 1850, passed a law prescribing standard colors and numbers for buoys, as follows: "Hereafter all buoys along the coast, or in bays, harbors, sounds, or channels, shall be colored and numbered, so that passing up the coast or sound, or entering the bay, harbor, or channel, red buoys with even numbers shall be placed on the starboard hand, black buoys with uneven numbers on the port hand, and buoys with red and black stripes on either hand. Buoys in channel ways to be colored with alternate white and black perpendicular stripes." As a result of this law, the buoyage system of this country has been uniform for a good part of a century; and change as regards features covered by this law would require an Act of Congress, and unless approved by maritime interests certainly could not be brought about. In the United States the buoyage system is very simple, and few rules have been adopted beyond the provisions of this law. The most important additional rule is the starboard hand buoys shall have pointed cone-shaped top (nun), and port hand buoys shall be cylindrical or truncated cone-shaped with a flat top (can), but this does not apply to spar, bell, whistle, or gas buoys. In lighting channels and entrances preference is given in the United States to red lights on the starboard entering, and white lights on the port hand; although no rigid rule has been adopted, this standard system of light colors is now in use for sixty-two channels and entrances of this country, including the principal ports, such as New York, Boston, Baltimore, Norfolk, Savannah, Jacksonville, Galveston, San Francisco, Cleveland, and Detroit. The extensive and important neighboring light system of Canada is entirely on this plan. It is believed this standardization can be advantageously extended, but it is not at present considered practicable to adopt it universally for all lights at all entrances.

### Seeking Simplicity

For the greater convenience of mariners, and also an account of the very difficult practical problem involved in handling annually some 12,000 buoys, for over 8,600 buoy

stations, all relieved annually, special effort has been made in this country to keep the buoyage system as simple as practicable. For this reason top marks are not used (as being ineffective and interfering with efficient handling), parti-colors are not used excepting as specified in the law, (because of difficulty of painting), and green buoys are not used for wrecks. The green color for wreck buoys is considered unnecessary, and also less informative to the mariner than the standard colored buoys which sufficiently cover the case of wrecks, treating them the same as other obstructions. Furthermore, in recent years green has been found to be a quite distinctive light for special locations, and is thought to be so valuable for such purposes that it should not be reserved exclusively for wreck marking.

As to the principal features, the buoyage systems of the western hemisphere appear to be uniform at the present time, and the situation throughout the world is such that substantial uniformity on the more important matters would appear to be within reach without serious hardship to any nation. It is probably not feasible or desirable, for the present at least, to consider uniformity excepting as to the main features.

[The statements as to numbers of buoys and lights above, excepting for this country, are only rough approximations, as complete statistics are not available, but the figures are sufficiently close for the purposes of this statement. The information as to buoyage systems of other countries, etc., is largely taken from the charts and statements compiled by the International Hydrographic Bureau.]

## CURRENT NAVAL AND PROFESSIONAL PAPERS

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*An Escaper's Log;* a narrative of a prisoner's escape during the World War. D. Grinnell-Milne.

*Human Experience;* a study of its structure for the general reader not trained in philosophy. Viscount Haldane.

*What the League of Nations is;* a short account of what the League is and what it is doing. H. W. Harris.

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*Four Years Beneath the Crescent;* varied World War experiences of a freelance. R. De Nogales.

*Absalom Grimes, Confederate Mail Runner;* adventure and narrow escapes of this daring character. ed. M. M. Quaife.

*Cassandra;* the future of the British Empire. Gilbert Schiller.

*The Story of the Atom;* an exposition of this subject for the non-technical reader. W. F. F. Shearcroft.

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*Bernadotte and Napoleon,* 1799-1810; second phase of this famous character. Sir P. Barton.

*The Ship Model Builder's Assistant.* Illustrated. Charles G. Davis.

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*Tales of the Clipper Ships.* C. Fox Smith.

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*The Dardanelles;* an authoritative account, covering the entire campaign, by a military expert. Maj.-Gen. C. Callwell.

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*Modern World History,* 1776-1926; written from the point of view of the new history, from which social changes and political movements are more important than isolated military and political events. A. C. Flick.

*Porto Rico;* history and conditions, social, economic and political. Knowlton Mixer.

*History of Ireland,* 2 vols.; an attempt to sum up, fairly and in a spirit of detachment, the case of Ireland and England. Sir James O'Connor.

*Temperament and Race;* a practical consideration of racial psychology. Babcock & Porteus.

*History's Most Famous Words;* when, where, why, and by whom the great sayings were used. Mrs. C. Smith.

*History of England;* from the earliest times to the Great War, combining the qualities of a textbook with an analysis of social development. G. M. Trevelyan.

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"The Russian Communist Party Today"; dissension in the ranks. J. Ossooskii. *Living Age,* November 15, 1926.

"The Continental Steel Cartel"; Europe gets together. J. Kaliski. *Living Age,* November 15, 1926.

"Among the Macedonian Revolutionists"; the invisible terror of the Balkans. F. deGerando. *Living Age,* November 15, 1926.

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# Notes *on* International Affairs

FROM NOVEMBER 3 to DECEMBER 3

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## UNITED STATES AND LATIN AMERICA

WARNING OVER NICARAGUA.—Following immediately upon his election and recognition by the United States, President Diaz of Nicaragua sought the aid of our government in persuading the Liberal revolutionists to accept his offers of amnesty and posts in the cabinet. In response, Secretary Kellogg issued a statement in which he expressed the hope that these offers would be accepted, and gave the warning that "interference from outside sources" was viewed with concern in Washington. This was taken as a direct reference to Mexico, from which, as shown by official reports, there have been repeated gun-running expeditions in aid of the revolutionists. From high sources in Washington issued information regarding alleged efforts to spread bolshevist Mexican influence throughout Central America.

President Diaz, who had previously been president in 1910 and 1913, was elected recently by the Nicaraguan Congress, after the withdrawal of General Chamorro under pressure from Admiral Latimer, U.S.N., who had intervened in the interest of peace. General Chamorro seized power after the withdrawal of U.S. marines last year. The Liberals who opposed Chamorro regard Diaz as no more acceptable. They express the fear that United States interests in the Nicaraguan canal strip and Fonseca naval base, together with investments in the Nicaragua bank and railways, may again lead to occupation of the country by American forces.

MEXICAN CRISIS THREATENED.— The approaching enforcement of the Mexican alien land and oil laws, which take effect January 1, was regarded as threatening a rupture of relations between the United States and Mexico. Despatches from Mexico on December 1, however, suggested the possibility that the laws might be further suspended pending renewed negotiations.

The U. S. Department of State published in November the last two notes to Mexico since July and the Mexican replies. The Mexican note of November 17 accepted the principle of the rights of property against retroactive or confiscatory legislation, but denied that the laws in question were of this character, and called upon the United States Government to "indicate concrete cases of violation," which the Mexican Government would be disposed to repair. It denied that the agreements of the conference of 1923 had the force of a treaty, or that they were pledged in return for American recognition. It was stated that British and other foreign firms in Mexico had already acted in compliance with the new laws.

PROPOSED SALE OF TACNA-ARICA TO BOLIVIA.—In a memorandum sent to Chile and Peru and published December 1, Secretary Kellogg proposed that the two nations cede the disputed Tacna-Arica territory to Bolivia, in return for suitable payment. The memorandum pointed out that negotiations, arbitration, and plebiscite had proved unproductive, and that the transfer to Bolivia offered a solution without sacrifice to the national honor or dignity of Chile or Peru.

## LEAGUE AND WORLD COURT

ECONOMIC CONFERENCE ON MAY 4.—The preparatory commission for the International Economic Conference completed its work at Geneva on November 18, and suggested May 4 as the meeting day. Although both the United States and the French delegates pleaded for a real conference which could decide questions and secure practical results, the commission as a whole decided

that the coming meeting should be limited to general discussion and consultation. It recommended that the delegates, to be appointed by all economically important states, should be chosen for their personal qualifications rather than as representatives of their governments.

The program provides for (1) statements by delegates from each country on "the present economic position," and (2) discussion of a wide variety of topics under the heads of commerce, industries, and agriculture, including such problems as tariffs, ship subsidies, international industrial agreements, and international agreements between organizations of producers and consumers.

PREPARATORY ARMS COMMITTEE ENDS WORK.—The work of the Preparatory Commission for the Disarmament Conference ended on November 5 with the framing of a complete report. This will be submitted to the various governments for study prior to the next meeting of the committee, to be held probably in the spring. It was the consensus of opinion in the committee that a general conference was impossible before 1928.

The American delegation expressed their satisfication in that the final report set forth not merely majority opinions but the views of all countries interested.

RUMORS OF ASIATIC LEAGUE.—Reports from London early in November suggested the possibility of some kind of common agreement in process of formation among Turkey, the Soviet Republic, China, Persia, and other Asiatic powers exclusive of Japan. The chief basis for these rumors was the recent visit of Chinese and Persian delegates to Angora, and more especially the meeting at Odessa of Foreign Minister Tchitcherin of the Soviet Republic and Tewfik Rushdi Bey, the Turkish Foreign Minister.

"The basis of this belief," wrote the London correspondent of the New York *Times*, "comes from two Eastern lands, both of whom are seething with unrest and hatred of the Occident—Turkey and China. The reports . . . . are such as to make even people far from credulous believe that there is a new coalition forming with the avowed aim of combating the Western World and especially the principles fixed by the Washington Conference."

The formation of any kind of "Oriental League" was, however, specifically denied by Turkish leaders, who pointed out that the whole trend of the present Turkish Government was toward a rapid "Occidentalization" in national customs and political affiliations.

RUSSIAN-TURKISH MEETING AT ODESSA.—A meeting of the Soviet and Turkish foreign ministers was held at Odessa on November 14. Official reports described it merely as a kind of love feast cementing Russo-Turkish friendship. In Western capitals it was interpreted as probably a preliminary step clearing the way for Turkey's application for membership in the League of Nations, rather than as the beginning of an "Eastern Locarno" or "Asiatic bloc." It was pointed out that the projected Russo-Turkish trade treaty still hangs fire.

PRESIDENT COOLIDGE ON THE WORLD COURT.—In his Armistice Day speech in Kansas City, President Coolidge made some significant remarks regarding our part in the World War, and on preparation against future conflict.

Referring to the oft-repeated assertion by Europeans that the United States profited by the World War, the President said:

"We did not profit from it, but lost from it in common with all countries engaged in it. Some individuals made gains, but the nation suffered great losses. Merely in the matter of our national debt it will require heavy sacrifices extended over a period of about thirty years to recoup those losses."

The President reassured the world that the United States did not desire competitive military building and favored further limitation of armaments.

"We expect to provide ourselves with reasonable protection, but we do not desire to enter into competition with any other country in the maintenance of land and sea forces," he said.

Should occasion arise for conscription in the future, he declared, "it should be all inclusive, applicable in its terms to the entire personnel and entire wealth of the nation."

Perhaps the most interesting passages in the speech, from an international standpoint,

dealt with the United States and the World Court. The President said in effect that many nations had indicated their unwillingness to accept the senate reservations without modification, that he would not ask the senate to modify its position, and that unless the senate reservations were met he saw no prospect of this country adhering to the court.

In comment on the speech, European critics remarked that the United States had played a large part in the war and an even larger one in making the peace. "It was on American inspiration," said the London *Evening Standard,* "that the European powers were tied up—if we may be allowed the figure—like a bag of snakes. That was done on the assumption that America would play the part of snake charmer in chief. That part she has refused." The London *Daily News* declared that her economic interests in Europe would make permanent isolation on the part of the United States an impossible policy.

## GREAT BRITAIN

AUTONOMY OF DOMINIONS CONFIRMED.—The agreement upon full equality and autonomy for the British dominions was confirmed, subject to action of the British Parliament, in the final report of the Imperial Conference of Premiers. The definition of the status of the dominions, as adopted by the conference, was as follows:

"The position and mutual relations of the group of self-governing communities composed of Great Britain and the dominions may be readily defined. They are autonomous communities within the British Empire, equal in status and in no way subordinate one to the other in any aspect of their domestic or external affairs, though united by a common allegiance to the crown and freely associated as members of the British commonwealth of nations."

The report declared that the tendency of the dominions toward equality was both right and inevitable, distance making federation impracticable. In view of the changed status of the Irish Free State, the King's title will omit "United Kingdom" and will be altered slightly to read:

"George V, by the Grace of God, of Great Britain, Ireland, and the British Dominions Beyond the Seas, King, Defender of the Faith, Emperor of India."

Each of the dominions stands on the same footing as Great Britain, free, equal and self-governing, but united in a commonwealth of nations by allegiance of all to the King. Although in the matter of foreign relations of the empire as a whole the chief responsibility is left with Britain, the dominions have the same power to make treaties as the mother country, and when all join in a treaty the British ministers will sign for Great Britain alone, and the ministers of the dominions will sign for the dominions, with Canada signing next after Great Britain.

In reference to the Locarno Treaty, the report approved the negotiations and the results, but pointed out that "This, of course, does not commit the British dominions to incur obligations under the treaty of Locarno unless they so desire." None so desired.

A comprehensive plan for control of immigration was also adopted, the dominions maintaining the right to take only such immigrants as they wish, after limitation and careful scrutiny, rather than any the mother country may wish to send.

COAL STRIKE DRAGS ON.—On November 13 the British coal strike was reported over when the miners' delegates accepted the peace terms proposed by the government. These, however, were afterwards rejected by a close vote of the whole body of miners, to whom they were referred. Thus, though perhaps a third of the miners have gone back to work on separate agreements, the strike still continues.

The government terms would have forced the miners to accept longer hours, lower wages in some cases, and district agreements rather than a national agreement. It would have been binding for three years.

The national loss from the strike has been estimated at from eight to fifteen million dollars a day, and unemployment relief is now paid to over 2,300,000. Public sentiment appears to have supported the miners, as shown by the increased labor vote in recent municipal elections, and by the loss of prestige of Baldwin and the Conservative Government. These changes may hasten nationalization of the mines.

## FRANCE

POINCARÉ PROGRAM SUCCESSFUL.—At the opening of the French Parliament on November 12 Premier Poincaré at once insisted that all other questions should be subordinated to consideration of the budget, during the short session to end December 20, and, demanding a vote of confidence on this issue, he was supported 365 to 207. The budget amounted to 33,000,000,000 francs and had already been approved by the financial committee of the chamber. The latter also declared the French debt terms with the United States were more favorable to France than those with Great Britain.

## MEDITERRANEAN STATES

MORE POWER FOR MUSSOLINI.—Following the latest attempt upon Premier Mussolini's life, the fascist cabinet issued a series of "emergency legislation" measures, the general effect of which was greatly to increase the police power against enemies of fascist rule. The premier will appoint the courts martial which will apply military law to political crimes. These political crimes are extended to include almost anything from attempts against the head of the state to "spreading exaggerated reports." Emigration is practically prohibited to anti-fascisti. Hostile organizations are dissolved and their newspapers suspended. A special fascist secret police force is created, and the Premier has taken over the Ministry of the Interior, his seventh cabinet post, in order to have the appointment of police officials and control personally this new campaign.

FRICTION BETWEEN FRANCE AND ITALY.—Anti-French feeling in Italy, arising chiefly from the use of French soil as a refuge and center of activity by plotters against the fascisti, culminated after the latest attack on Mussolini in a number of affairs of violence. At Ventimiglia, near the French frontier, French railroad employees were arrested and an enthusiastic fascist made a hostile speech from the balcony of the French consulate; at Benghazi in Tripoli an Italian colonel demanded that the Italian flag should be hoisted along with the French on the French consulate.

Ill feeling was increased by the arrest in France of Colonel Riccotti Garibaldi, grandson of the great Italian leader, who confessed that he had been paid by the Italian police to act as a spy and agent-provocateur among anti-fascisti. It was shown also that Italian police had operated within France, using forged passports.

As a result of protests from France, Premier Mussolini made formal apologies for the Ventimiglia and Benghazi affairs.

ITALIAN GUARANTEE TO ALBANIA.—In addition to her treaties with Jugoslavia, Greece, and Rumania, Italy on November 27 signed a compact of friendship and security with Albania. In the treaty Italy guarantees the territorial integrity of Albania, with the further agreement that neither party shall "conclude with other powers political or military agreements prejudicial to their mutual interests." Albania, though thus taken under Italian protection, is treated on a plane of full sovereignty.

RESULTS OF GREEK ELECTIONS.—The Greek parliamentary elections, held early in November on a proportional representation basis, gave the various republican parties only a slight majority, with about 145 seats out of a total of 287. Indications were that the chamber meeting on December 6 would ratify the Constitution of 1925 and continue the republic. A coalition government of the five major parties was formed on December 2. Elimination of the army from Greek politics was secured, so it was hoped, by the creation of a non-partisan commission of officers to control appointments and promotions. The moderate press in Athens hailed the coalition as ending a decade of civil strife.

## NORTHERN EUROPE

NO ACCEPTANCE OF VILNA DECISION.—In reply to recent Polish protests, the Soviet Government on November 21 sent a note to Poland saying that the Soviet Treaty with Lithuania in no wise violated the Riga Treaty of 1921 with Poland, but that the Soviet Government joined with Lithuania in refusing to accept the Council of Ambassadors' decision about Vilna as final, and in refusing to recognize the authority of this body to settle such a matter as the Polish-Lithuanian frontier.

SOVIET COLONY ON WRANGEL ISLAND.—According to a recent report from Moscow, the Soviet Government last summer landed fifty families of Eskimos, with three Russian men and three women administrators, on Wrangel Island, north of Siberia, and provided them with three years' supplies.

In 1924 a Russian government vessel ousted from the island Charles Wells, a U.S. citizen who professed to be acting for Great Britain, and who had attempted to settle on the island with a party of Eskimos.

SILESIAN ELECTIONS FAVOR GERMANS.—German news items stated that the November local elections in Polish Upper Silesia so strongly favored the German party as to make necessary a revision of the plebiscite partition of that region. The Germans received 60 to 70 per cent of the vote in the towns, only the country districts going Polish.

## FAR EAST

CRISIS AT HANKOW.—At the close of November the Cantonese forces in China were continuing their northward progress and were threatening the capture of Foochow, capital of Fukien province, with a population of 700,000. They had shifted their headquarters to Hankow on the Yangtse and boasted an extension of their influence over 600,000 square miles in Central China with a population of 200,000,000.

At Hankow, where the Cantonese were in full control, native labor was organized on Russian lines and a general strike was threatened to begin on December 4. This, it was believed, was intended as a preliminary step toward the seizure of the customs administration and other foreign concessions. British, French, and also United States marines were landed for the protection of foreign interests. In spite of the lateness of the season, the U.S. destroyers *Pope* and *Truxton* were ordered up the river in addition to the four river gunboats already at the city under Rear Admiral H. H. Hough, Commander of the Yangtse Patrol. Destroyers were also ordered to Nanking and Foo-chow.

BELGIAN TREATY DENOUNCED.—As a forecast of the Chinese policy toward all international agreements, other nations viewed with concern the formal annulment (November 6) by the Peking Government of the trade treaty of 1865 with Belgium. Technically, the treaty terms provided that it could be abrogated only by Belgium. Belgium had offered to negotiate a new treaty as soon as the United States, Great Britain, France, and Japan would do the same. Belgium also proposed that the matter be taken before the World Court, and when China refused to join, she did so unilaterally.

Similar requests for new treaties based on "equality and reciprocity" were sent by China to the other nations having treaties with her. Although the Peking Government is practically powerless, its action in the matter of the treaties was fully approved by leaders in Southern China.

EXTRATERRITORIALITY REPORT.—The joint report of the Commission on Extraterritoriality in China, of which the U.S. Commissioner Silas H. Strawn was chairman, was made public on November 28. It was signed by delegates of the thirteen nations represented at the Peking Conference which adjourned indefinitely last July. The report called upon China for extensive reforms before extraterritoriality could be granted, but suggested that (1) prior to complete execution of reforms the powers "might consider the abolition of extraterritoriality according to such progressive scheme (whether geographical, partial, or otherwise) as may be agreed upon"; and (2) pending the abolition of extraterritoriality, the powers should make certain modifications in the existing system.

The report first emphasized the present demoralization of government in China, which it attributed chiefly to (1) the domination of military leaders, (2) the depletion of the treasury, and (3) the lack of uniform legal systems owing to the establishment of independent laws and courts in areas not recognizing the central government.

It then called for an extensive program of legal and judicial reforms, including protection of the judicial branch of the government from political interference; adoption of a civil, commercial, and revised criminal code; and development of a system of modern courts and prisons, with provision for their support. It finally suggested the

concessions noted in the first paragraph above.

CHINA'S FOREIGN TRADE.—According to figures cited in an article by James H. Dolan in *Current History* for October, Japan's share in the foreign trade of China has fluctuated as follows: 4% in 1885, 20% in 1913, 33% in 1918, 25% in 1921. Since 1921 it has been again increasing. Aside from the immense commerce through Hongkong, moreover, the direct trade between Japan and China increased between 1904 and 1918 more than seven-fold. Japanese corporations with offices in China increased from 1,200 in 1913 to over 6,000 in 1921. In the same period British firms increased from 590 to 725. In 1924, out of a total of forty-two foreign banks, Japan had twenty-nine. Japan controls 90% of China's iron production and 27% of her coal.

According to Mr. Dolan, since the end of the Anglo-Japanese Alliance Japan has pursued more vigorously a policy of rapprochement with China, employing such more or less effective devices as entertainment of Chinese business delegations and the "Pan-Asiatic Conference" of last August. In the tariff conference, Japan, while protecting herself by special agreements, planned to gain a reputation as China's "best friend" by favoring tariff autonomy in 1929, but when the other powers fell in line on this proposal she intrigued to make the conference abortive.

As for the right of extraterritoriality, this is of far less consequence either to Japan or to the United States than to Great Britain, with investments in China amounting to perhaps a billion dollars. Surrender of this right might have been a shrewd step on the part of the United States, but thus far we have chosen to act with the other powers. American trade with China amounted to $300,000,000 in 1925 and is growing.

# Book Reviews

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## REAR ADMIRAL SAMUEL FRANCIS DU PONT, UNITED STATES NAVY

A Biography By Colonel H. A. du Pont. National Americana Society.

A Review by Rear Admiral (Retired) Albert Gleaves, U. S. Navy

Admiral du Pont was one of the three outstanding figures in the Navy during the Civil War. He shared with Farragut and Porter the highest honors.

A few years ago the diary of Mr. Gideon Welles, the War Secretary of the Navy, from 1861-65, was published. It was an entertaining book and won great popularity, but as history its value is impaired by hostile, acerbent, and often unfair criticism of nearly all the principal officers of the Navy. He did not speak their language, to use a common phrase, and apparently never understood them, du Pont least of all. For instance, he writes under date of October 2, (1862) "Admiral du Pont arrived today; looks hale and hearty. He is a skillful and accomplished officer. Has a fine address, is a courtier with perhaps too much finesse and management, resorts too much to extraneous and subordinate influences to accomplish what he might easily attain directly, and like many naval officers is given to cliques—personal, naval clanship."

Admiral du Pont's biographer renders real service in presenting his uncle in a very different light. He tells simply "the story of a well spent life, which has its value both as an inspiration and an example."

Colonel du Pont is well qualified for his task. In the first place, by education and training he has a keen sense of military values, which the Secretary by his training could not possibly have. Colonel du Pont was graduated from West Point at the head of the class of '61; he served with distinction in the Valley Campaigns, and for meritorious conduct at the Battle of Cedar Creek he was awarded the Congressional Medal of Honor. He writes with obvious veneration and affection, and as one having the authority not only of official documents but of the Admiral's personal and private correspondence.

Colonel du Pont does not concern himself with sketches of sea life in earliest times, nor does he attempt to draw pen portraits of the Admiral's mind and opinions. The motif of the book is to show that du Pont was not responsible for the failure of the attack on Charleston and he gets to the point as soon as possible. The main interest of the book centers there.

Du Pont was appointed a midshipman on waiting orders December 19, 1815, when a few months over twelve years of age, and made his first cruise in 1817 on the U.S. Frigate *Franklin*, flagship of Commodore Steward's Mediterranean squadron. The author gives only one-third of his volume to du Pont's career up to the War with Mexico. With the exception of two incidents he passes hastily over the first thirty years, and those incidents, which under present conditions would be of ephemeral interest only, but which at the time excited lively comment throughout the whole country, he discusses in detail. The first was when Commodore Hull took his wife and sister-in-law with him in the Frigate *Ohio*, bound to the Mediterranean, and to make room for the ladies, ousted the four senior

lieutenants from their comfortable quarters in the ward room and sent them down on the orlop deck. Any sailorman knows what that means. All the wardroom officers of the *Ohio* made indignant protest to the Secretary of the Navy. Commodore Hull reprimanded the four lieutenants for insubordination. The Commodore then on his own initiative detached them from the *Ohio* and ordered them to report in person to the Secretary of the Navy. Upon their arrival in the States they appealed personally to the Secretary, claiming they had been unfairly treated, who, after careful investigation, disapproved of their detachment by the Commodore and ordered them back to their ship. The officers were Pendergrast, du Pont, Missroon, and Godon, names well known to the students of naval history in the Civil War.

The other incident was an attack made by Spanish soldiers and civilians on officers of the *Ohio* and *Brandywine* at a carnival ball in Port Mahon. Du Pont, who happened to be the senior officer at the ball, reported the affair to the Commodore, who was content with a lame and inadequate excuse by the Governor, and the government at Washington allowed the matter to drop. Three years later, in 1842, a lieutenant from the *Congress* was stabbed to death in Port Mahon by a native, and if Washington took any action it is not on record in the files of the State Department. And yet Charles Dickens, ten years later, writing of the United States as one of the greatest nations of the earth, said "it is honourably remarkable for protecting its subjects wherever they may travel, with a dignity and a determination which is a model for England!"

Du Pont's opportunity did not come in the Mexican War. That was an Army affair, but he did see a bit of active service on the West Coast when in command of the *Cyane*. He seized La Paz, and later at the head of a landing party from his ship, he relieved a beseiged American force near San José; but those were only outpost affairs.

A chapter of the biography is devoted to the celebrated "Star Chamber Board", as it was called, of 1855. The board was appointed for the purpose of "Increasing the Efficiency of the Navy" and was composed of fifteen members, five captains, five commanders and five lieutenants, all marked men in the service. Du Pont was third in seniority of the commanders, Pendergrast and Franklin Buchanan ahead of him, Samuel Barron and Andrew H. Foote following. There was a precedent for the board. Forty years before the Army had appointed such a board to eliminate their dead wood, but it never created the cyclonic disturbance caused by the report of the Naval Board of '55. For a score of years afterwards it was a matter of wardroom discussion in the Navy, and is even now, sixty years after the event, often referred to. Out of a total of 712 officers, 201 were placed either on the reserved list, or dropped as unworthy; even the "grand old man" of the Navy, Charles Stewart, who had captured, simultaneously, two British frigates, and the great oceanographer Matthew Fontaine Maury, were removed from the active list. That Stewart had reached four score, and had not been to sea for thirty-five years, and that Maury had been permanently disabled for naval life in 1839 were matters of no moment to an indignant public. So fiercely did the storm beat upon the Navy Department that many who were "plucked" were restored, and some of these afterwards distinguished themselves in the Civil War, which suggests the futility of such boards. Our own "plucking board" of recent date was the legitimate successor of the Star Chamber Board and was generally approved by the service until it made several grievous mistakes, which so turned the service against it that it was abolished. Unfortunately, something worse was substituted. The present selection board, which has few advocates in the service is an outcome of the other two, but is not a lineal descendant. It is related, but not recorded, that when the '55 board was appointed, a well-known commander who at the time was on leave abroad, wrote to a member of the board in effect: "It is the best news I've heard! Apply the knife ruthlessly and cut deep." It is not known if his point of view changed when notified that he was transferred to the reserved line.

Although du Pont was eighth in seniority on the board, the burden of public abuse fell upon him, and he was singled out for bitter attacks in Congress, notably by old General Sam Houston, Senator from Texas. In a manner, it was a distinction, a sort of recognition of his leadership and prominence.

Before taking up du Pont's service during the war it is appropriate to say something of the man himself. He is best described perhaps by the Latin phrase *bene nati, bene vestiti, et bene docti,* of a most distinguished family, brought up in the refinements of a cultured home, he bore through life the unmistakable stamp of a gentleman. As a midshipman he was known for his neat attire, his attractive manners, his handsome appearance; and in later years he was often spoken of as "the handsomest man in the Navy." All accounts agree that he was an accomplished seaman, and a master of his profession. Admiral Dahlgren who succeeded him off Charleston wrote, "He was tall and of very fine presence . . . . with an irresistible voice and smile; loved by men and boys was Frank du Pont!" Ammen, who commanded the *Patapsco* in both attacks upon Charleston, and who knew him intimately, wrote, "Professionally he was thoroughly able; he possessed undaunted courage, energy and zeal; his education was of a high order, and his character might serve as a model in every respect. . . . . In appearance he was distinguished, over six feet in height, admirably proportioned, graceful and urbane, with an intelligent expression, and no officer in our Navy within the past half century was gifted with a more distinguished appearance or exalted character."

This then was the man who had the misfortune at the outset to incur the displeasure of the Secretary of the Navy, a fact attributed by Colonel du Pont to the inability of Mr. Welles to appreciate "the atmosphere of old fashioned and somewhat formal courtesy in which du Pont had been reared."

Handicapped from the first by the Secretary's antagonism, and also by the activities of the horrid, slimy spawn, invariably engendered by war, it was no wonder this valiant sailor should be crowded to the wall and made the scapegoat when the attack on Charleston failed. We are not suprised that Colonel du Pont exercises but little restraint in dealing with this phase of the Admiral's career.

In September, 1861, du Pont was assigned to the command of the so-called South Atlantic blockading squadron with the frigate *Wabash* as his flagship. Seven weeks afterwards he fought the battle of Port Royal. It was a brilliant victory and assured his place in history. Had it been followed up at once by joint operations with the Army, it is probable that both Savannah and Charleston would have fallen in a short time, but the War Department was not disposed to join in combined expeditions, and later when it was decided to make a "demonstration" in Charleston harbor, Mr. Welles insisted that it should be a purely naval affair. Now the Secretary had two obsessions, the invulnerability of the *Monitor,* and the ability of the Navy to capture Charleston without the coöperation of the Army. He could not have accepted Field Marshal Sir William Robertson's opinion that "upon the Cabinet devolves the responsibilty for combining the whole military, naval, diplomatic, financial and economic forces of the nation for the defeat of the enemy." Nor did he appreciate in the least the strategic fact that the Army was essential to the success of the naval assault on the forts of Charleston. This is not surprising for he had had no military training nor a qualified staff to advise him. Satisfied as he wrote in his diary afterwards that du Pont was antagonistic to the Department, he persisted in ignoring the Admiral's admonition that "in all such operations to secure success troops are necessary." Whether or not du Pont pressed this point must be left to the reader's opinion.

The fleet attacked the forts in the afternoon of April 7, 1863, and failed. The action lasted less than two hours, and though "no ship had been exposed to the severest fire of the enemy over forty minutes," five monitors were disabled, and the *New Ironsides,* the flagship, was roughly handled, having been hit between sixty and seventy times. The next morning the *Keokuk* sank.

The Navy Department and the North had confidently expected the monitors to reduce the forts, break through the channel obstructions, and anchor off the city before night. There was not much comfort in the thought that while "the attack was a failure, it was not a disaster."

The Secretary put the blame entirely upon du Pont apparently forgetting that he had announced "the Department will share the responsibilty imposed upon the commanders who made the attempt," an absurd position of course from a military point of view, as no senior can share his responsibility with

a subordinate. Acrimonious correspondence followed between du Pont and the Secretary. Certain charges of disobedience of orders were rumored, but according to Ammen they were simply technical, as was also the alleged failure to coöperate with General Gillmore. The outcome was that du Pont was relieved of his command.

Admiral Luce, in a lecture at the Naval War College, has tersely summed up the situation as follows: "du Pont and his command were placed in an utterly false position by being called upon to solve an unsolvable problem, viz, the capture of Charleston without adequate cooperation by the Army."

The last two years of Admiral du Pont's life were passed at his home at Louviers on the Brandywine. He died June 23, 1865, several years before reaching the statutory limit of active service. To quote Admiral Dahlgren's tribute: "He did his duty to his country in peace and war, and finally ended a grand career as admiral. Peace to thy ashes, gallant heart, loyal in every pulse."

## THE LAST CRUISE.

By Louise Kidder Sparrow (Mrs. Herbert G. Sparrow). The Stratford Company, Boston. $3.00.

Reviewed by Captain H. E. Lackey, U.S. Navy

The story of the last cruise of Captain Herbert George Sparrow, U.S.N., as told by his wife is a graphic and complete account of the fate of a true naval officer. It is a volume that casts much light on Captain Sparrow's noble character and his wide culture. It is an account which, by means of the personal and intimate touches, the reader may discern the fibre of the man who, in the face of death, became a real hero.

To the naval service in particular this book should be of extreme interest. It has been said that inspiration is often the mere recollection of deeds of heroism and from the deed of such an officer, as Captain Sparrow, there can be derived an example of self-sacrifice and devotion to duty that should be ennobling to all who read of it.

The first seventy-five pages of this book comprise extracts from letters of Captain and Mrs. Sparrow to each other. The letters breathe the spirit of a great romance. They add the personal touch—the vein of human interest that permeates and so affects the tragedy, and even deepens it, when it is realized that each was without news of the other for days before the end. For it was while recovering in part from the shock of the disaster to the vessel, and free from thought of personal danger to its personnel, that the blow suddenly fell.

The sequence of these letters leads up to the Captain's tragic death, and this portion of the volume is climaxed by the pathetic fact that many of these letters were received too late.

The exact official account of the catastrophe is published in this volume, and an extract from the proceedings of the court of inquiry also appears. One may read many official accounts of post-humous courts but one will look far before finding such a veritable eulogy. It concludes: "To the last, the spirit of the true officer showed forth—his one concern being not for himself, but for the ultimate safety of his ship and his men. His fate is, in the opinion of the court, one of the most poignant tragedies in the history of the Navy."

The last twenty-five pages are taken with "A Sheaf of Poems"—verses collected by Captain Sparrow, and, in several instances, sent as clippings to his wife. This section of the volume reveals part of the literary taste of Captain Sparrow, and, to a degree, his high regard for the aesthetic both in human relations and in nature. They are little pearls that had been gathered here and there. They carry to the reader, the Captain's love of the sea, his devotion and thought of wife and family, and his wholehearted trust in "His Great Captain," whom he always loved and to whom he was faithful unto death.

To those who are interested in naval traditions and the great deeds of those of our service there can be gained a moral and professional stimulus from reading of the unflinching courage and faithfulness with which Captain Sparrow met his end.

## ALL THE WORLD'S AIRCRAFT

founded by Fred T. Jane—Compiled and Edited by C. G. Grey and Leonard Bridgman—1926. Sampson Low, London. $12.50 postpaid.

Reviewed by Captain H. C. Richardson, (C.C.), U.S. Navy

This is the sixteenth year of issue of this annual which is more comprehensive

than ever. An interesting innovation is the curtailment of the airplane and engine sections to a record of new types brought out in the past year, at least that is the aim; more correctly it covers information "released" in the past year and is not necessarily complete.

This year the form is arranged in four parts:

(A) The world's aëronautical progress.
(B) All the world's airplanes including the section on helicopters.
(C) All the world's aëro engines.
(D) All the world's airships.

The world's aëronautical progress is comprehensive giving a fairly accurate survey of each nation's activities including the aëronautical associations, aëronautical reviews and journals, air transport companies, civil air stations, naval and military stations and the commercial and military organization. This is most complete for the English, French, German, Spanish, United States, and Italian services. The latter is particularly interesting due to the multiplicity of cabinet positions held by Signor Mussolini, effecting in a very definite manner the establishment of an organization of Italian national defense. The description clearly outlines the subordination of war, navy and aëronautics. The Japanese organization can only be surmised, but from the description appears to have separate army and navy air services.

Russian interest in aviation appears to be intense, but from this review one would judge it to be ineffective and exaggerated.

The United States is given credit for catapult development dating from about 1914; as a matter of fact, the first successful launching took place in November, 1912.

The Schneider Cup Race entries of last year are illustrated. The influence of these and the Pulitzer racers is clearly reflected in England where the Fairey planes are using Curtiss engines, Reed propellers and follow the principles of clean design incorporated. Fairey, on his own, forced the Air Ministry's hand by departing radically from their permitted methods and details of construction, the results being superior performance which had to be recognized.

"Noteworthy Flights of 1925-26" are more noteworthy for the omission of Byrd's Polar flight. This would be curious if it were not that this annual is edited by C. G. Grey, who, however, notes the subsequent flight of the *Norge*.

A general survey of "All the World's Aëroplanes" shows a stronger trend towards monoplanes and triple power plants particularly in commercial planes. Metal construction has made definite advance. National resource considerations cause England to favor steel though duralumin is gaining ground.

In France and Germany duralumin has made great headway. In Holland and the United States welded steel appears to be more in favor although in this country duralumin and composite constructions are common.

All metal boat hulls are of duralumin. Tail floats are disappearing. The long tail principle and central floats following United States' practice are becoming more general. Triple floats developed in this country are used in the successful Rohrbach planes. As a result of the Schneider Cup Races, the short design of wooden racing floats has attained a high degree of refinement, their characteristics of clean running and almost complete absence of porpoising are noticeable.

In Germany, light planes and gliders, principally monoplanes, have considerable vogue. In England, the light plane, both monoplane and biplane, have been popularized by a definite propaganda and government support with a view to developing a reserve of pilots and to familiarize the public with aircraft.

Commercial aëronautics in Europe is very extensive and gaining under government subsidies. Outside of Europe, Australian, Canadian, and Columbian activities are outstanding. In our own country, except for the air mail no definite organization is apparent, but thousands of planes are engaged in public flying. The newly established division of aëronautics in the Department of Commerce, when its first census is complete, will undoubtedly show some surprises.

All sections relative to the United States are worth reading as they give a good cross section of aëronautics in this country.

Items worthy of note are the articles on the Handley-Page slotted wing, the Hill tailless monoplane and the Beardmore engines. The subject of helicopters is given

a special chapter, although as a matter of fact, it is devoted to a description of the Cierva "Auto-Giro," which is not a helicopter.

By a slight stretch of the function of this annual, it is made to include descriptions of the principal aircraft carriers.

THE BOOK OF THE AËROPLANE. By Captain J. Laurence Pritchard. Longman, Green & Co., New York. $2.75.

The student or layman will find in the *The Book of the Aëroplane,* by J. Laurence Pritchard, a modern and excellent treatment of the subject. There is a great deal of material from which to pick, and the author has made good use of it.

After dealing in an interesting way with the early history of aviation, including the achievements of such men as Leonardo da Vinci, Sir George Cayley, Lilienthal, and Langley, the author leads up to an account of the Wright brothers and their machine. The aëroplane, itself, is now discussed, showing its construction and how it flies. The engine, the elevators, the rudder and the ailerons are shown to be the controlling units in flight. Very interesting accounts are given of some famous flights which include Bleriot's hop across the English Channel, Hawker's and Grieve's attempted non-stop flight across the Atlantic, Alcock's and Brown's non-stop flight across the Atlantic, and Smith's successful flight from England to Australia. The author does not neglect the commercial side, for in three chapters he deals with the great air ways of the world, the ground organizations which make these possible, and safety in the air. Great stress is laid upon making the aëroplane itself safe and augmenting this safety by means of wireless and efficient personnel. There are chapters dealing with the development of the engine, the aëroplane in war and various types of land planes and seaplanes.

The final chapter treats of the future of the aeroplane. In this the author makes many bold prophesies which the laymen can hardly understand. He sees the aërial age near at hand with its gigantic land planes as palatial liners, great ocean going seaplanes with the cabins, dining room, and saloon; sporty aërial runabouts breaking the rules of the road, and flying traffic cops. The future air mail liners are to be weather proof and will carry out their schedule more regularly than the fast mail trains. Great aërial surveys will reveal the secrets of South America, India, Burma, and Australia, for there are vast stretches which have never been surveyed by man, hardly ever trodden by him. Finally, the wireless controlled aëroplane and the aërial torpedo are described as weapons which may be directed to deal out destruction with certainty as yet only partly foreseen.

The author has a British viewpoint, especially in the chapters on "Some Famous Flights," "Types of Aëroplanes and Seaplanes," and "Aëroplane Engines." No chapters on famous flights can be complete without a description of Commander Read's flight across the Atlantic in the *NC-4* and the late Captain John Rogers' attempted flight to Honolulu, which have been omitted. Only brief mention is made of the "round the world flight." The chapter on types of aëroplanes and engines deal principally with British products.

The book as a whole is exceedingly interesting and well written. It tells the story of the aëroplane in simple and understandable language, and makes an acceptable addition to aviation literature.

A. C. McF.

THE DARDANELLES EXPEDITION. A Condensed Study. By Captain W. D. Puleston, U. S. Navy. U. S. Naval Institute. 1926. 154 pages. $2.00.

Reviewed by Lieutenant-Colonel Adna R. Chaffee, U. S. Cavalry

In *The Cavalry Journal* October, 1926

The study is illustrated by sixty-seven plates, prepared by the author and Lieutenant-Colonel G. L. McIntee, General Staff, United States Army. These plates show the situation from day to day and are so placed as to enable the reader to follow the narrative with the greatest ease.

Captain Puleston is a graduate of the Army War College as well as of the Naval War College and, hence, is especially qualified to undertake the study of an amphibious campaign.

In this book he has shown with clarity and brevity the events leading up to this ill-fated expedition which was originally conceived by a civilian minister as "a naval

expedition to bombard and take the Gallipoli Peninsula with Constantinople as its objective." These events furnish for us but another example of the danger of interference of civilians, with only a smattering of military knowledge, in the details of war plans. Captain Puleston believes that it is doubtful if even Great Britain could survive another World War and another Churchill.

The naval operations preceding and accompanying the landing of troops are shown in such simplicity and fullness that they are easily followed by a landsman.

The book emphasizes the necessity of a single command in joint operations. It brings out the thorough understanding of the capabilities and limitations of ships and troops must exist, not only in the War and Navy Departments for the preparation of strategical plans, but also in the command and general staffs of quite small units who may be called upon to prepare and execute the tactical operations.

The study gives much food for thought to officers of the Army along the lines of the preparations which are necessary to secure landings upon a hostile shore, the tactics of these landings and the rapid expansion of beach heads. Interesting supply and communication problems are presented.

The book should be in the library of all officers who have reached the grade where, in the event of war, they may find themselves in the command or general staff of a unit engaged in an oversea campaign.

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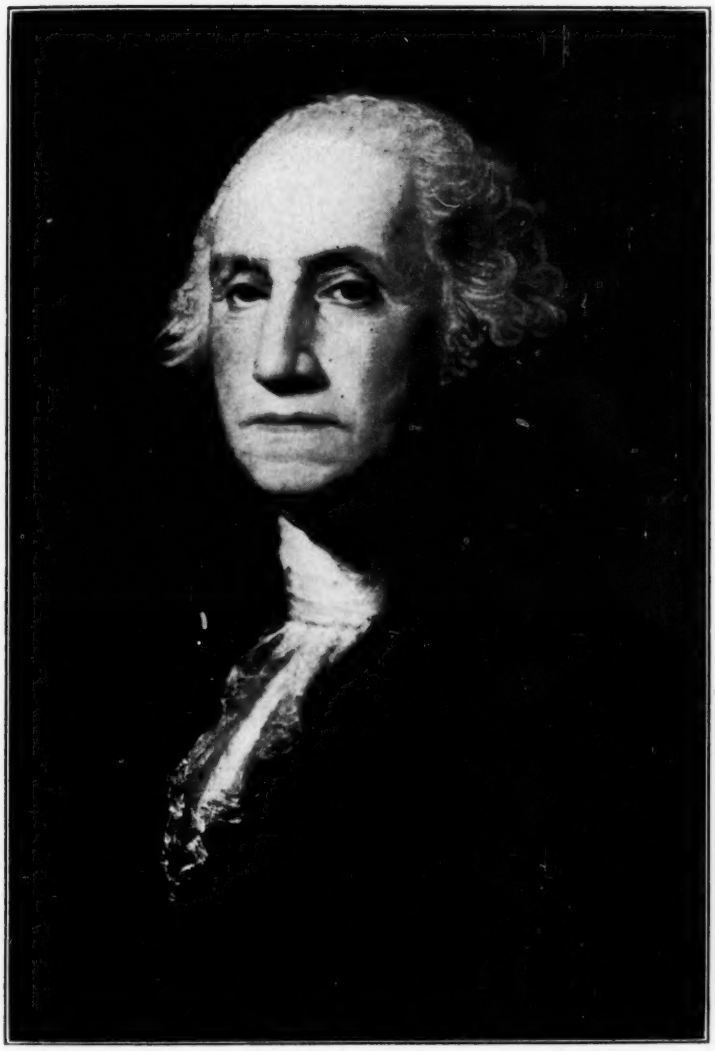
## Submarines and Disarmament Conferences—Appendix

(*Continued from page 69*)

*List of References*

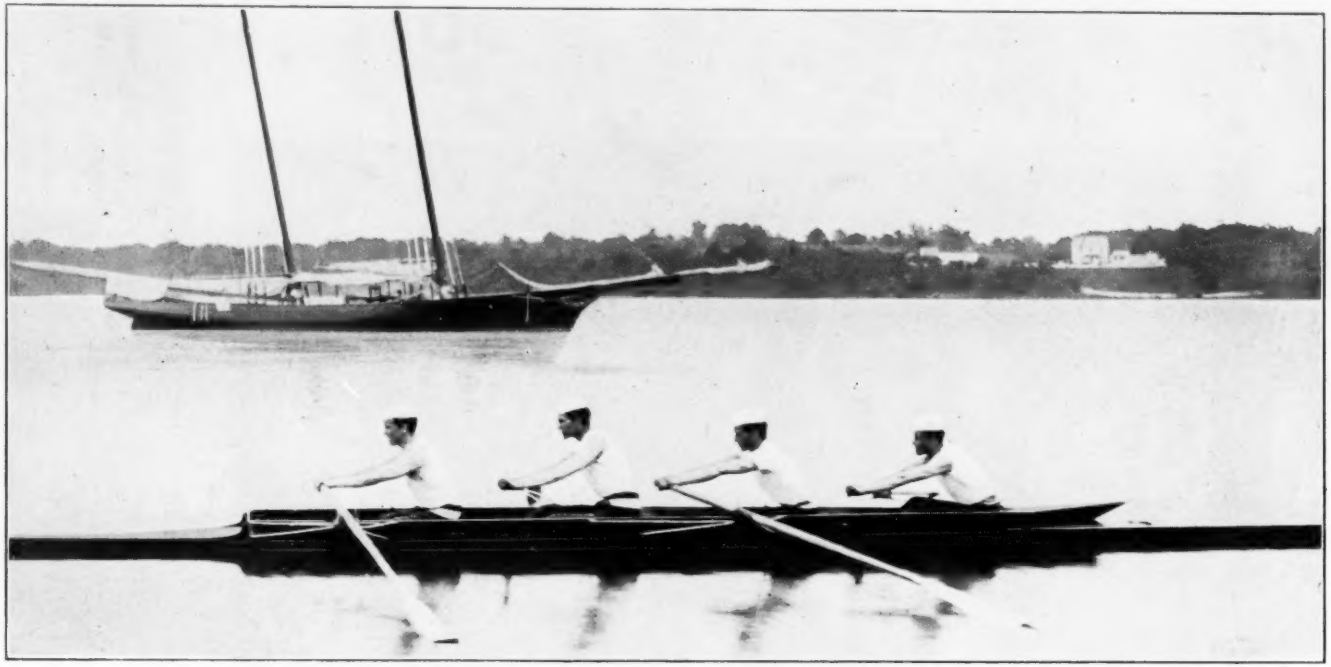
| *Reference Letter* | *Book or Document* |
|---|---|
| E | *"U.S. Naval Policy."* Based on the Treaty for Limitation of Naval Armament. Approved by the Secretary of the Navy December 1, 1922. General Board No. 420-2 (Serial 1108) March 29, 1922. |
| F | *"Annual Report of the Secretary of the Navy,"* for the fiscal year 1925. Washington, Government Printing Office, 1925. |
| G | *"American Naval Policy, as Outlined in Messages of the Presidents of the United States."* Washington, Government Printing Office, 1924. |
| H | *"The Great Pacific War,"* by Hector Bywater. Houghton Mifflin Co., Boston and New York, 1925. |
| K | *"A Treatise on International Law,"* by William Edward Hall, M.A. Eighth Edition edited by A. Pearce Higgins, etc., Oxford at the Clarendon Press, 1924. |
| M | *"International Law and the World War."* Vol. I. By James Wilford Garner. Longmans, Green & Co., London, New York, etc. 1920. |
| N | *"Instructions for the Navy of the United States Governing Maritime Warfare."* June, 1917. Washington, Government Printing Office. |



GEORGE WASHINGTON

One of the two copies from Stuart originals owned by the Naval Academy.

Editor's note: Compare this picture of Washington with the one opposite page 70 of this issue of the PROCEEDINGS.



THE YACHT "AMERICA" AS NAVAL ACADEMY TRAINING SHIP AND THE CHAMPION CREW OF '69 AND '70
(HUBBARD, STROKE; GALLOWAY, WOOD AND POST)

The famous yacht, sold to private parties after her career in the Confederate and Northern navies, was in 1921 restored to the Naval Academy by the generosity of the following public spirited citizens:

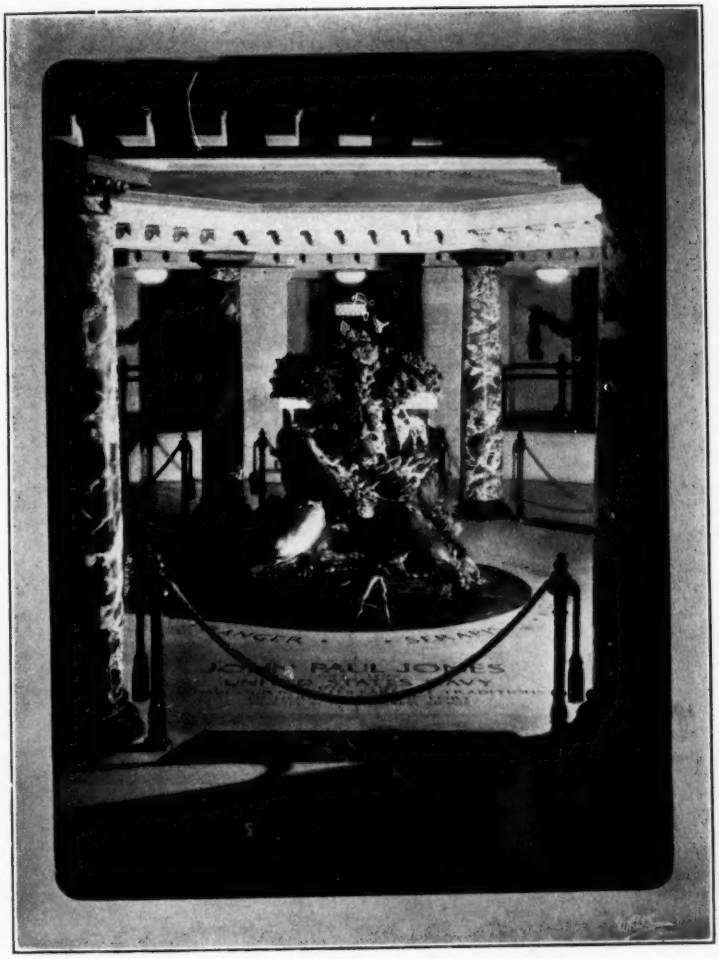
Charles Francis Adams, Elmer Jared Bliss, Harry B. Bradford, S. Parker Bremer, Willard H. Brownson, Arthur H. Clark, Albert W. Finlay, Charles H. W. Foster, Sidney A. Friede, James B. Ford, Louis S. Frothingham, John Good, Roger Griswold, Henry Howard, James Jackson. Arthur Curtiss James, Demarest Lloyd, Frank B. McQueston, Edgar Palmer, Thomas Nelson Perkins, Robert M. Thompson, Henry Walter, John W. Weeks.

Cohasset Yacht Club, Corinthian Yacht Club of Marblehead, Corinthian Yacht Club of Philadelphia, Eastern Yacht Club, Fall River Yacht Club, Larchmont Yacht Club, Manchester Yacht Club, Marine and Field Club, New Bedford Yacht Club, New Haven Yacht Club, New London Chamber of Commerce, Newport (R. I.) Chamber of Commerce, Pleon Yacht Club, Quincy Yacht Club, Rhode Island Yacht Club, Seawanhaka Yacht Club, Stamford Yacht Club.

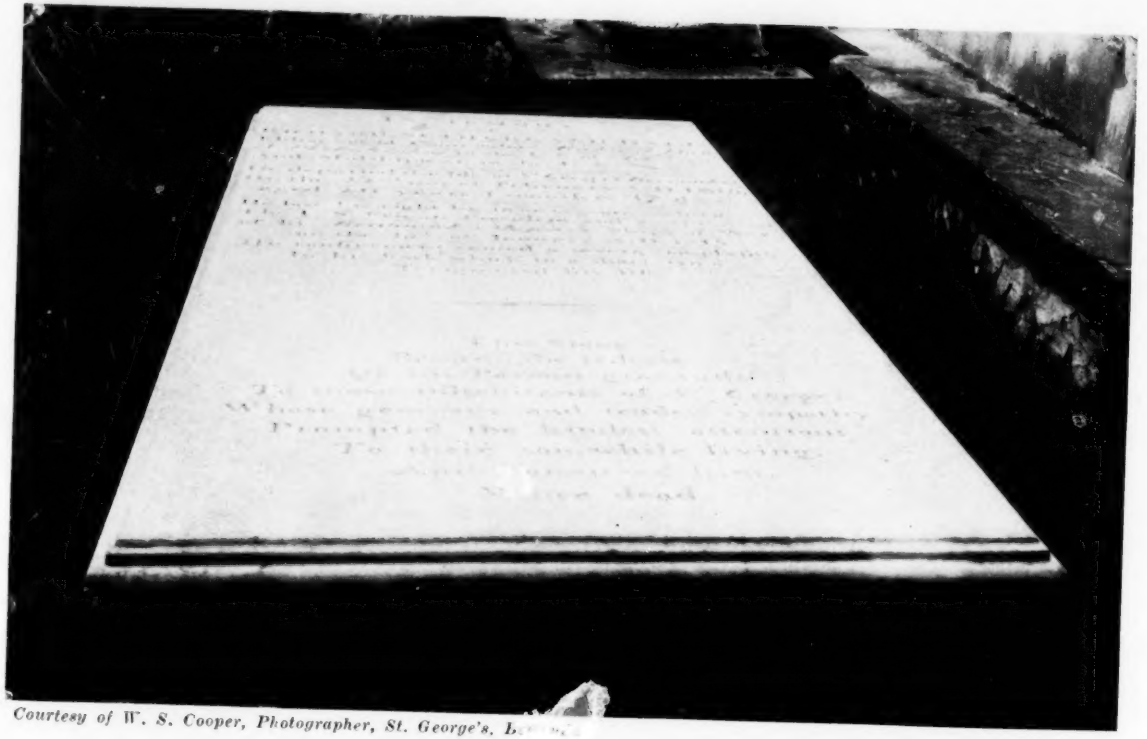
America Restoration Fund Committee. Charles F. Adams, Chairman; James Jackson, Treasurer; Wm. U. Swan, Secretary; T. N. Perkins, Chas. K. Cummings.

Yacht Club, New London Chamber of Commerce, Newport (R. I.) Chamber of Commerce, Pleon Yacht Club, Quincy Yacht Club, Rhode Island Yacht Club, Seawanhaka Yacht Club, Stamford Yacht Club.

America Restoration Fund Committee. Charles F. Adams, Chairman; James Jackson, Treasurer; Wm. U. Swan, Secretary; T. N. Perkins, Chas. K. Cummings.




THE TOMB OF JOHN PAUL JONES ERECTED BY CONGRESS, 1912
IN THE CRYPT OF THE CHAPEL, U. S. NAVAL ACADEMY



*Courtesy of W. S. Cooper, Photographer, St. George's, Bermuda*

TOMBSTONE OF MIDSHIPMAN RICHARD SUTHERLAND DALE, ST. GEORGE'S, BERMUDA
In the cemetery of "God's Acre," St. Peters Church, exposed to the weather, the lettering is becoming obliterated.

# Buried *Among* Friends

THE editor, enjoying a portion of his vacation last summer in St. George's, the old capital of Bermuda, happened to stroll through the cemetery known as "God's Acre," surrounding St. Peter's Church, said to be the most ancient English Church site in the western world, and ran across an old, weatherbeaten, horizontally-placed tombstone. It immediately attracted his attention, as it marked the grave of a young midshipman of the United States Navy, who lost his life in the War of 1812. The tombstone appears in the photograph on opposite page, and has been printed through the courtesy of Mr. W. S. Cooper, photographer of St. George's, Bermuda. It has the following inscription:

IN MEMORY
OF
RICHARD SUTHERLAND DALE
ELDEST SON OF COMMODORE RICHARD DALE
OF PHILADELPHIA IN THE U. S. OF AMERICA
AND MIDSHIPMAN IN THE U. S. NAVY

He departed this Life at S$^{t}$ George's, Bermuda,
on the 22$^{nd}$ day of February, A D. 1815,
aged 20 years 1 month & 17 days.
He lost his right leg in an engagement between
the U. S. Frigate President and a squadron of
his Brittanick Majesty's Ships of War on
the 15$^{th}$ of January, A. D. 1815.
His confinement caused a severe complaint
in his back which in a short time
Terminated his life.

This Stone
Records the tribute
Of his parents' gratitude
To those inhabitants of S$^{t.}$ George's
Whose generous and tender sympathy
Prompted the kindest attentions
To their son while living,
And honored him,
When dead

Thinking the matter might be of interest to the readers of the PROCEEDINGS, Professor Allan F. Westcott, of the editorial staff, has prepared the following notes:

The engagement mentioned in the inscription was the famous action which followed the attempt of the *President*, under Captain Stephen Decatur, to run the British blockade off the port of New York. At daybreak of January 15, 1815, about sixty-five miles off Sandy Hook, the *President* was sighted by the British blockading squadron, consisting of the ship of the line *Majestic* and the frigates *Pomone, Tenedos,* and *Endymion.* The pursuit of the *President* lasted until five P. M., when the leading enemy frigate, the *Endymion,* far ahead of the rest, had come within close range. Decatur then turned and engaged. The running action with the *Endymion* continued for two and a half hours, at the end of which the guns of the British vessel were silenced and her rigging severely injured.

In the darkness Decatur now hoped to make good his escape, but a clearing of the sky at 11:30 P. M. revealed the two fresh ships *Pomone* and *Tenedos,* which had been able to keep in touch. The *President* then surrendered, having suffered a loss of twenty-four killed and fifty-six wounded. Three of her five lieutenants were killed. There was some foolish argument later as to whether the *President* was taken in a single ship action or by a squadron, but this was settled by the British Admiral Cochrane, who bluntly remarked, "The *President* was completely mobbed." (Maclay; *History of the Navy,* LL, 92.)

The prize was taken to the Bermudas, and here Midshipman Dale died from the effects of his wound. He had served nearly three years in the Navy, having entered as a midshipman, together with his younger brother, on June 18, 1812.

His father, Commodore Richard Dale, U. S. N. (1756-1826), was a Virginian by birth, able lieutenant under Paul Jones in the *Bonhomme Richard,* and in 1794 fifth in rank among the six captains assigned to command the new frigates then building. It was in the *President* as flagship that the father sailed in command of the first expedition sent against the Barbary corsairs in 1801-1802.



In the cemetery of "God's Acre," St. Peters Church, exposed to the weather, the lettering is becoming obliterated.

# Secretary's Notes

***Robison's "Manual of Radio Telegraphy and Telephony"***

The Secretary regrets to announce that the sixth edition of this book, which has had a wonderful sale in all parts of the world, is exhausted. Steps are being taken to get out a seventh edition, revised and brought strictly up to date, in the near future.

***The Management of the Naval Institute***

From time to time the Secretary receives letters indicating that there is considerable lack of information as to how the affairs of the Naval Institute are managed, and particularly with regard to the acceptance and rejection of manuscript for publication in the PROCEEDINGS. Perhaps a short résumé would prove of interest, and it is with this idea in view that the following information is published for the readers of the PROCEEDINGS.

Each member of the Board of Control, except the President and Vice-President, reads all the articles submitted for publication in the main body of the PROCEEDINGS, as well as the discussions; an unanimous vote is required for acceptance. In case of acceptance articles are paid for in full at the time, and it is believed that the Institute's rates are quite liberal. In this connection, it has come to the Secretary's notice in the past year that the rates received by naval officers and certain civilian writers for their articles, published in several of the leading magazines of the country, were approximately one-half what these writers would have received from the Institute had their articles been accepted and published in the PROCEEDINGS. For specially meritorious articles the Board of Control authorizes substantially higher rates.

The date of appearance of any article is at the discretion of the Board of Control, which further reserves the right not to publish an article should it appear desirable for any reason to take such action. Articles become the property of the Institute upon acceptance of payment by the author, and they will be copyrighted by the Institute upon publication. They cannot be used for any purpose whatsoever before or after publication except by permission of the Naval Institute. In accepting articles for publication, the Institute reserves the right to have them revised or re-arranged when necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS, deducting the cost, if any, from the compensation of the author. The acceptance of book reviews and photographs rests with the editor.

The Board of Control meets once each month at Annapolis to act upon any articles that have not received an unanimous vote of acceptance, and before an article is rejected it is gone over thoroughly in conference before final decision is made. The Board endeavors to see that the pages of the PROCEEDINGS cover a wide range of subjects by foreign and American contributors, officers and civilians, many of whom are distinguished in their specialties; and it is believed that a large portion of the articles accepted and published are so written as to interest the Institute's large civilian associate membership, as well as the regular membership, consisting of officers of the Navy, marine corps, and coast guard.

To the editor of the PROCEEDINGS and his staff is left the selection of articles to be published in each issue, and the editorial staff endeavors each month to put out a well-balanced issue: some theory, some discussion of present-day methods with constructive criticism, book reviews, professional notes, notes on international affairs, some naval history, narrative, and occasionally general engineering subjects. It will be interesting to the readers of the PROCEEDINGS to turn to the Index in the December, 1926, issue of the PROCEEDINGS, to note the wide range of subjects covered during the calendar year 1926.

It is desired to point out again that the Naval Institute is on a solid financial foundation, and its net worth is in the neighborhood of a fifth of a million dollars. The income from its invested capital allows it to print and sell its professional textbooks at a minimum price. It is also desired to point out that, aside from the articles appearing in the main body of the PROCEEDINGS, it would be necessary for a reader to spend over $300 to say nothing of time for some seventy-odd magazines, periodicals, and newspapers, in order to have placed before him the information that appears during the year in the "Professional Notes" department of the PROCEEDINGS. This department has recently been improved by the inclusion of translations from foreign language periodicals, prepared by Assistant Professor Henry Bluestone, of the department of Modern Languages, U. S. Naval Academy. The attention of the readers is invited to the fact that the "Notes on International Affairs," a department conducted by Professor Allen F. Westcott, of the Department of English, U. S. Naval Academy, will, if followed, keep one fully informed of what is going on politically in all parts of the world. This department is not made up of notes and clippings, but is a well written and digested account prepared by Professor Westcott, as a result of his voluminous reading each month.

In addition to its duties, as described above, in regard to manuscript, the Board of Control (including the President and the Vice President) also passes upon all the important business policies of the Institute. Financial accounts are audited annually by a firm of certified public accountants.

***Naval Leaders of today, like those of previous years, are members of the Institute.***

Seeing constantly in the front pages of the PROCEEDINGS each month the list of the Institute's early presidents, curiosity prompted the Secretary to examine the record of the members for the past twenty years, and he discovered that with two exceptions, every commander-in-chief of the American Navy, from Rear Admiral Robley D. Evans to the present time, has been a member of the Naval Institute; every Chief of Naval Operations, from Rear Admiral Richard Wainwright, in 1909, has also been a member.

***The Aquino article***

Eighteen years ago last month, Commander Radler de Aquino, Brazilian Navy (then a lieutenant) first published to the English-speaking world, in the pages of the PROCEEDINGS, his article "Altitude and Azimuth Tables," and it seems quite fitting therefore that the PROCEEDINGS should at this time carry the article in this issue entitled "Modern Methods in Sea and Air Navigation." The entire world at this time is vitally interested in aërial navigation, and a great deal of time is being spent on discovering methods which will result in insuring accuracy and in saving time, as well as reducing the number of books and tables to be consulted. Any method which retains speed and scientific accuracy, while reducing bulkiness and the number of books to be consulted, will be a great boon to navigation of aircraft. It is hoped that the publication of this article will prove timely and interesting.

***The Unusual Picture of Washington***

Numerous articles have appeared during the past year concerning Washington, and it is believed that the reproduction of this interesting picture, together with the short account by Lieutenant Commander Hazard, will be of unusual interest. To accentuate the difference between the picture published with the article by Lieutenant Commander Hazard and the ordinary picture of Washington, there also appears in this issue one of the two copies from the Stuart originals owned by the Naval Academy, the latter said to be one of the finest portraits of Washington. It will be recalled that Washington suffered from the ravages of smallpox, and most portraits of him do not show the disfiguring marks. It was painted five years before his death.

***An Engineer's Education***

At the time of the inauguration of Captain Ralph Earle is president of the Worcester Polytechnic Institute, a little over a year ago, some pertinent remarks were made by Mr. Walter M. McFarland, vice-president of the American Society of Mechanical Engineers, a graduate of the Naval Academy in 1879. It is believed that the following quoted remarks will be of interest to all the readers of the PROCEEDINGS. He said:

At the present time I think it is safe to say that that there is little question of the great benefit of technical education. There is still occasional criticism, and in the past there was a great deal, that the graduates of our technical schools do not know as much as some of the people in the management of industries seem to have expected them to know. I think a careful analysis would show that the fault is with the people who expect altogether too much and are really asking for the impossible. All that the technical school can do is give its graduates a good foundation in basic principles so they are prepared to attack the problems which come when they get into active life. When Dr. Hollis and I graduated from Annapolis almost fifty years ago there was a good deal of talk among older engineers in the Navy about the difference between practical and theoretical men. What this meant was that the practical men were the ones who had not gone to a technical school but had served a shop apprenticeship and had been educated in the school of hard knocks. My experience showed me that the so-called practical men, as a rule, were only good at overcoming difficulties which were almost repetitions of previous occurrences. When problems arose that were entirely novel the theoretical men, so-called, were the ones who found the solution. Many of our great industrial establishments, recognizing the mutual dependence of the technical schools and the factories, have arranged to supply the practical and special experience through their own engineering apprenticeship courses.

***President Coolidge on Discipline***

"The theory of government implies that every official, so long as he retains office, shall deport himself with respect toward his superiors. This is especially true of those in the military service. Unless this rule is applied there could be no discipline in the Army and Navy, without which those two forces would not only be without value as a means of defense, but would become actually a menace to society. Discipline is the whole basis of military training."

***What a Johns Hopkins Professor of History thinks of America***

According to the Baltimore *Sun* of December 4, 1926, the United States is becoming the world's greatest menace to peace and human progress, if Dr. John H. Latane, professor of American History at Johns Hopkins University, is correctly quoted. In an address at the university on "Germany enters the League," Dr. Latane made the following remarks at an opening meeting of the Maryland Branch of the League of Nations Nonpartisan Association:

This country is less favorable to arbitration than it was 125 years ago. When we were weak we wanted things settled by peaceful means because we had no force to apply. But now that we have it we are not so keen for judicial settlements.

I believe that we are further from the League of Nations now than we were two years ago but our presence at Geneva with the present administration in power would not be a good thing. We ought not to enter the league until our people are educated to the point of appreciating this dream of the world throughout the ages and of wanting to take part.

The opinion of Latin America and the opinion that is growing in Europe, is that our government is the most pernicious instrument of domination known throughout the ages. When I found American missions on finance, on education, on naval affairs directing matters in Peru; when I found thirty-two American naval officers running the Brazilian Navy, and when I realized that American financial administrators were functioning in one-half of the countries of Latin America, I could appreciate their opinion.

It is more than high time that intelligent people in this country rid themselves of the idea that the United States is the greatest and best nation on earth; that its people are the greatest and best, and that they are not going to harm anyone. When the Allied forces went into Germany, the German and allied commanders came to American headquarters to learn the law of military occupation because we were the only nation that had had any considerable experience with it.

No country has such a record for imperialism since 1900 as ours; no country has added so large a population or so much territory to its domain, or occupied by force so many countries.

On top of it all we profess our own moral superiority to the rest of the earth and just after we have gone through the rottenest period of moral corruption in public administration any modern civilized country has ever seen, with the participants still on trial, and when we have more murderers than any nation on earth. Our talk of morality makes the world tired.

After the Treaty of Locarno was signed the sentiment expressed was, "Thank God, America was not here to destroy this agreement."

By refusing to associate ourselves with the other nations of the earth, our senate merely sacrificed its own power over foreign affairs. It kept us out of the league, but it has not kept us out of European politics, which now is handled, without reference to the senate, by means of unofficial talking and non-talking delegates, appointed by the President but not confirmed by the senate because they are unofficial.

An example of the futility for our present position is furnished by the case of Turkey. A general treaty doing away with all extraterritorial privileges was signed by the League of Nations without our taking part.

After that we were offered the same treaty and told to take it or leave it. All Americans in Turkey are urging the United States to accept it by all means. A complication arises here, for if we sign the Turkish treaty are we going to refuse similar privileges to China?

I believe that the Chinese situation will come to a showdown in the near future, with China denouncing all of the treaties forced upon her. The question is: What will we do then? I believe that we will back China in her struggle for fair treatment.

The League of Nations is a permanent institution. One reason I feel certain of this is that all of the smaller powers are for it; it gives them for the first time a real open forum.

Sir Edward Grey said that if the powers could have been got together in a reasonable time to discuss the Austrian ultimatum to Serbia the World War never would have broken out at that time on that issue. Geneva today affords opportunity for just such discussion.

***What Chicago and the Middle West think about the Army and Navy***

In the Chicago *Tribune*, of November 3, 1926, appeared an editorial entitled "A Great Game and its Meaning." The editorial, in full, follows:

The Army-Navy game is over. The cadets and the midshipmen have gone. Soldiers' Field is tenanted by a memory—not of just a mighty football game, but of a bravely splendid spectacle, a superlative dedication of patriotism, such as never will be matched again.

For we here in Chicago and the middle west did dedicate ourselves, during two short days, to a new understanding, a new upholding of the national defense.

The young men from West Point and Annapolis and the older men of the two services must have understood, while they were here, what we thought of them and all that they stood for. It is our duty for the future to show them that they understood rightly.

The Army and the Navy, we believe, discovered the middle west. And the middle west, we know, discovered the Army and the Navy.

It was no mere greeting, a sociable gesture, that we gave them. It was a sincerely profound outpouring of patriotic emotion. From a young thing's "Thrilling," a ragged newsie's "Gee, ain't they swell," to a Vice President's "It is something to make us proud of our country," it was an occasion when we talked and felt in superlatives and truly meant every word and every emotion.

We are proudly confident that the middle west exhibited a hospitality that overwhelmed a little those whom we welcomed in a spirit of reverent enthusiasm. The Army and the Navy did not know the greeting we had in store for them. We did not know it ourselves until we saw the corps in gray and the regiment in blue—3,000 finest examples of every merit that has been claimed for military and naval training—swing through the stinging sleet of that stormy Friday and go marching down Michigan Avenue between crowds of men and women who felt as they had not felt since columns of olive drab marched there eight years ago.

We are proud of those who managed the event for us. President Kelly of the south park board and all those who administered the details of organization and the execution deserve every good thing that has been said about them. That those who came representing and leading the two academies were pleased, and said so, is abundant reward. For these leaders and to the credit of their training, be it said that the crowded procession of events could not have unrolled so smoothly swift had it not been for the perfection of disciplined energy which midshipmen and cadets displayed in the highest degree.

As for the game itself, not a spectator left it who did not say that it was one of the greatest games of football ever seen. And Walter Eckersall places his seal of expert approval on the verdict. It was, above even skill and strategy and physical fitness, a show of the sort of courage that makes men in battle charge and charge again until the objective is gained.

The 21 to 21 score made us all happy. We did not want either team to go away disappointed. In James O'Donnell Bennett's words, the greatest crowd in football history did not call the result of the game a tie, but a double victory. The packed stands cheered for the Army, yelled for the Navy, in one breath because they were there not as partisans, but as patriots.

Not as partisans, but as patriots. We promised not only to welcome West Point and Annapolis, the Army and the Navy, if they would bring their game here, but we pledged ourselves that their visit would be rewarded by a renewed guarantee of support for the services of national defense.

We learn from Washington that all is not well with the Army and Navy—the Army and Navy behind those creaseless, spotless gray uniforms and blue ones which we saw last week. We pledged our support. The Army and Navy need our support, need it now.

The paper strength of the Army, June 30, was 418,085; regular army, 134,412; national guard, 174,969; organized reserves, 109,604. And of the Navy, 123,643; regular navy, 91,441; organized reserves, 32,202. A total strength of 542,628.

This was what President Coolidge meant when he said at Kansas City that he was satisfied with the state of the services of national defense which represented a strength of about 550,000 men.

That strength is paper strength and purely fictitious. The actual strength of our military and naval forces is about half that number.

The regular army numbers only 123,000 men. The reduction was forced because there was not money enough to buy the larger number enough to eat. Out of the national guard there are only three divisions effectively equipped and trained. Instead of the six armies contemplated in the Defense Act of 1920, there are only three armies, with all skeleton units complete. The national guard divisions of New England, New York, Pennsylvania, and Ohio are the only ones to stand high enough in training and organization to take their place in the first line. The Illinois division lacks important units and is a doubtful qualifier for the first line. All other national guard divisions would be put in the second line.

The Act of 1920 contemplated a regular army of 280,000 men. This number has been cut successively to 191,799, to 174,536, to 144,148, to 134,770. And half of the regular forces are employed in training reserves, leaving insufficient numbers for border duty and the garrisons of the Panama Canal, the Philippines, and Hawaii. The Army's barracks are almost universally in poor condition. The Army is allowed only thirty-one cents a day per man for rations. Army service is becoming unpopular. There are insufficient funds to replace deteriorated ammunition and out-of-date ordnance and coast defense. A large part of the $89,000,000 to be spent on Army and Navy aviation in the coming year is money pared from other branches of the services.

The Navy is far below the 5-5-3 ratio set forth in the Washington Disarmament Conference and no building program to bring it up to that ratio is contemplated. The guns of United States battleships

are outranged by those of Great Britain. So low has the Navy's man power been forced by insufficient appropriations that it is reported that several battleships will be put out of commission in order to take their crews to man the new aircraft carriers *Saratoga* and *Lexington*. The budget bureau, in the face of this, has refused to grant any increase of the 1928 appropriation.

The Navy asked for $250,000,000 for a five-year aviation program. It was given $100,000,000.

The Army and Navy are being pinched and squeezed by decree of the budget bureau, approved by congress and the President, into ineffective penury. It has been the pride, and a proper one, of the administration that economy had come to Washington. The taxpayers are glad that it did come. They have been gratefully responsive to every tax reduction. But when economy cuts the forces of national defense below the point of efficiency and destroys not only their physical strength but threatens the pride of service which is at the heart of every sound national defense, then economy has become parsimony. The methods that are used on departmental clerks to make them careful of pencils and pen points are not the methods with which to govern the administration and maintenance of the Army and Navy of the United States.

Then economy becomes penny pinching and a dangerous practice because it plays into the hands of the pacifists, the Reds, the abject beings who would see our national defense done away with entirely.

We here in Chicago and the middle west pledged ourselves to a fresh effort to rescue the Army and Navy from their present state. We marked that pledge with a display of profound emotion on the occasion of an event that promises to become historic.

Chicago and the middle west will keep that pledge so that the young men in gray and the young men in blue who came here to see what we were like and let us see what they were like shall come into an inheritance of an army and navy of the United States fully adequate to every need and emergency and maintained in the perfection of effectiveness.

***Presidential Message to Congress***

"The wise theory of this government, so early adopted and steadily pursued, of avoiding all entangling alliances has hitherto exempted it from many complications in which it would otherwise have become involved. Notwithstanding this our clearly defined and well-sustained course of action and our geographical position, so remote from Europe, increasing disposition has been manifested by some of its governments to supervise and in certain respects to direct our foreign policy. In plans for adjusting the balance of power among themselves they have assumed to take us into account, and would constrain us to conform our conduct to their views. One or another of the powers of Europe has from time to time undertaken to enforce arbitrary regulations contrary in many respects to established principles of international law. That law the United States have in their foreign intercourse uniformly respected and observed, and they can not recognize any such interpolations there in as temporary interests of others may suggest. They do not admit that the sovereigns of one continent or of a particular community of states can legislate for all others.

"Leaving the transatlantic nations to adjust their political system in the way they think best for their common welfare, the independent powers of this continent may well assert the right to be exempt from all annoying interference on their part. Systematic abstinence from intimate political connection with distant foreign nations does not conflict with giving the widest range to our foreign commerce. This distinction, so clearly marked in history, seems to have been overlooked or disregarded by some leading foreign states. Our refusal to be brought within and subjected to their peculiar system has, I fear, created a jealous distrust of our conduct and induced on their part occasional acts of disturbing effect upon our foreign relations. Our present attitude and past course give assurances, which should not be questioned, that our purposes are not aggressive nor threatening to the safety and welfare of other nations. Our military establishment in time of peace is adapted to maintain exterior defenses and to preserve order among the

aboriginal tribes within the limits of the Union. Our naval force is intended only for the protection of our citizens abroad and of our commerce, diffused as it is, over all the seas of the globe. The government of the United States, being essentially pacific in policy, stands prepared to repel invasion by the voluntary service of patriotic people, and provides no permanent means of foreign aggression. These considerations should allay all apprehension that we are disposed to encroach on the rights or endanger the security of other states.

"Some European powers have regarded with disquieting concern the territorial expansion of the United States. This rapid growth has resulted from the legitimate exercise of sovereign rights belonging alike to all nations, and by many liberally exercised. Under such circumstances, it could hardly have been expected that those among them which have within a comparatively recent period subdued and absorbed ancient kingdoms, planted their standards on every continent, and now possess or claim the control of the islands of every ocean as their appropriate domain, would look with unfriendly sentiments upon the acquisitions of this country, in every instance honorably obtained, or would feel themselves justified in imputing our advancement to a spirit of aggression or to a passion for political predominance.

"Our foreign commerce has reached a magnitude and extent nearly equal to that of the first maritime power of the earth, and exceeding that of any other. Over this great interest, in which not only our merchants but all classes of citizens, at least indirectly, are concerned, it is the duty of the executive and legislative branches of the government to exercise a careful supervision and adopt proper measures for its protection. The policy which I had in view in regard to this interest embraces its future as well as its present security. Long experience has shown that, in general, when the principal powers of Europe are engaged in war the rights of neutral nations are endangered. This consideration led, in the progress of the War of our Independence, to the formation of the celebrated confederacy of armed neutrality, a primary object of which was to assert the doctrine that free ships make free goods, except in the case of articles contraband of war—a doctrine which from the very commencement of our national being has been a cherished idea of the statesmen of this country. At one period or another every maritime power has by some solemn treaty stipulation recognized that principle, and it might have been hoped that it would come to be universally received and respected as a rule of international law."

NOTE: The above quotation is from President Franklin Pierce's second message to Congress, December 4, 1854.

***Who initiated the custom of Men-of-War rendering honors when passing Mount Vernon?***

The Secretary a short time ago, while reading the autobiography of Charles Morris, published in the PROCEEDINGS in 1881, ran across what may prove of interest to others, viz., an account of a trip made by the U. S. S. *Congress* from Boston to Washington while Morris was a midshipman, in 1801, two years after the death of Washington. From this account, which appears below, it would seem that Captain Sever was responsible for the ceremony which is so well known today. The midshipman's account is as follows:

The ship was delayed by head-winds so that we did not reach Washington till late in May. We passed the frigate *United States* in the lower part of the Potomac. About ten o'clock in the morning

of a beautifully serene day, we passed Mount Vernon. Every one was on deck to look upon the dwelling where Washington had made his home. Mrs. Washington and others of the family could be distinguished in the portico which fronts the river. When opposite to the house, by order of Captain Sever, the sails were lowered, the colors displayed half-masted, and a mourning salute of thirteen guns was fired as a mark of respect to the memory of Washington, whose life had so recently been closed, and whose tomb was in our view. The general silence on board the ship and around us, except when broken by the cannon's sound, the echo and re-echo of that sound from the near and distant hills, as it died away in the distance, the whole ship's company uncovered and motionless, and the associations connected with the ceremony, seemed to make a deep impression upon all, as they certainly did upon me. When the salute was finished the sails were again set, the colors hoisted, and we proceeded up the river. The frigate *New York* had preceded us, without saluting, but we found her grounded on the bar at the entrance of the eastern branch of the Potomac, and the *Congress,* passing her, was the first ship of war that reached what has since become the navy yard at Washington. The frigates *New York* and *United States* joined us a few days afterwards.

## *Additional Donations of Manuscript to The Naval Historical Foundation*

Donations of historical material received by the Naval Historical Foundation up to October 8, 1926.

| Donor | Donation |
|---|---|
| Snow, Elliot | "Historical Sketch of the Navy Department Library and War Records," by Miss Isabel Smith and Rear Admiral Elliot Snow (CC) (Typewritten mms. with photos, March, 1926). |
| Frothingham, T. G. | Thirteen documents concerning gun boat administration, May, 1813 (manuscript).<br>Two newspapers—Boston *Repertory,* issues 1805; March 12 and March 15. |
| Preble, Miss | Copy of letter (4 October, 1866) from General J. P. Hatch to Commodore Preble *re* landing at Boyd's Neck, South Carolina, 29 November, 1864. (Endorsement in handwriting of Commodore Preble.) |
| Morgan, Colonel James Morris (ex-U.S.N. and ex-C.S.N.) | Book, *The Cruise of the "Alabama" and the "Sumpter,"* from the private journals and other papers of Commander R. Semmes, C.S.N., and other officers.<br>Book, *Prince and Boatswain.* Sea tales from the recollection of Rear Admiral Chas. E. Clark, as related to James Morris Morgan and John Phillip Marquand.<br>MSS. "The Chicamauga" by J. M. Morgan.<br>MSS notes by Clarence Cary, formerly Midshipman, C.S.N., on his Civil War journal. |
| Hunter, Caroline | MSS sketch of the military services of Samuel P. Carter, major general, U. S. Volunteers, during the Civil War, and formerly lieutenant, U. S. Navy. (Loan) |
| Snow, Elliot | Magazine article, "The Sinews of *Old Ironsides.* Some Interesting Sidelights on the Cordage Industry of 1790 and the Wide Range of Cordage Used for Vessels of the Period," by Rear Admiral E. Snow. June, 1926, issue of *The Cord Age.* |
| Marston, Major John, U.S.M.C. | MSS—About 200 documents from the correspondence of Commodore John Marston between 1852 and 1862. |
| Frothingham, Capt. T. G., O.R.C. | Book, *The Naval History of the World War 1917-18,* by T. G. Frothingham (Autograph Copy). |
| Burns, William F. | Book, *Captain Otway Burns, Patriot, Privateer and Legislator,* by Walter F. Burns. |

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|---|---|
| Miller, Capt. C. R. | MSS, "Old Sea Yarn." |
| Fox, Mrs. C. E. | Pamphlet, "The Autobiography of Commodore Charles Morris." |
| Yeandle, Commander S. S. | Pamphlet, "Brief Sketch of the Naval History of the U. S. Coast Guard" 1790-1922. |
| McClaran, Lt. Comdr. J. W. | Copy of letter of Commodore Fyffe. |
| Wainwright, Lt. Comdr. R. | Two letter-books of Rear Admiral R. Wainwright, while superintendent of the Naval Academy. |
| Burns, W. F. | Model (wood) of hull of Privateer *Snap Dragon* (War of 1812). MSS file copy of application for commission as a "Letter of Marque and Reprisal" for the private armed schooner *Snap Dragon.* Newspaper page (Black Mountain [N.C.] *Eagle,* August 7, 1909) containing speech of Honorable Walter Clark at Burnsville, N.C., on occasion of unveiling of monument to Captain Otway Burns of the *Snap Dragon.* |
| Editor of the *Confederate Veteran* | A set of the *Confederate Veteran* for years 1911-12-13-14-16-17-18-19-21-22-23-24-25. |

***How to Bequeath Money to The Naval Historical Foundation***

One may legally leave by will money to the Naval Historical Foundation by using the following form, which is in all respects legal and effective:

"I give, devise, and bequeath $..... to the Navy Historical Foundation, duly incorporated in the District of Columbia.

***Navigation Practical***

The following review of Commander Dutton's *Navigation and Nautical Astronomy,* recently published by the Naval Institute, appeared in the December number of *The Rudder:*

*Navigation and Nautical Astronomy,* by Commander Benjamin Dutton, U.S.N., is the latest work to reach this office on the subject of navigation. Commander Dutton, of course, knows his subject and he has written with the creditable conviction that others do not know. Many navigational works have presumed too much on the reader's knowledge. The Dutton book was prepared as a textbook for use at the Naval Academy and we are frank to say that it is the first book of its kind which we have read with delight. The price is $5.50, and, like all books on nautical subjects, it can be obtained from *The Rudder.*

***Membership***

New members joining since last report:

Andrus, L. A., Mr.
Baxter, H. F., Mr.
Bertun, C. A. K., Mr.
Babcock, G. L., Mr.
Brooks, LeRoy, Mr.
Carton, A. T., Mr.
Emanuel, Victor, Mr.
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Ford, Tod, Mr.
Galloway, W. S., Mr.
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Henderson, William, Mr.
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Welsh, Willard, Mr.